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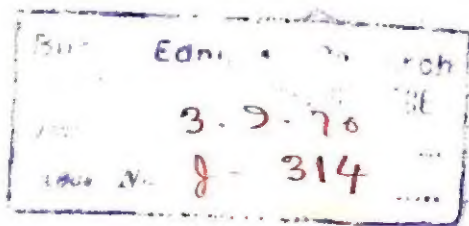


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PSYCHOTHERAPY WITH ADOLESCENT GIRLS IN A COURT CLINIC*

MURRAY H. SHERMAN

Psychotherapy with adolescents in a court clinic involves many problems of technique which differ considerably from ordinary procedures with self-sustaining adults. Girls who come to our attention have been brought to court by their parents because of acute discord at home. Parental complaints include such disciplinary problems as late hours, promiscuity (often an unfounded accusation), and general disrespect. Most often it is the mother who brings her teen age daughter to court. In these cases the father is either ineffectual or else there is a total absence of a father in the home. The court then becomes a substitute to the mother for the weak or absent father.

The mother's own motivations for bringing her child to court have many unconscious meanings. Almost always we find that she has provoked her daughter's "wildness" by grossly inconsistent handling. The mother will repeatedly tell the girl what she should not do until she does it. Then both of them become overwhelmed by guilt, jealousy, and anxiety. The court is seen as a means for restoring some sort of equilibrium and both punishing and condoning all wrong doing.

Despite these many neurotic motivations of the parents, it has been generally necessary to treat the girls themselves with some hope of promoting a stable family situation. The girls' attitude towards attendance at the Clinic is almost always overtly hostile and negativistic to begin with. These negativistic feelings often conceal an underlying need to be forced into attendance, and the entire relationship to the Clinic is conceived of in terms of a sado-masochistic retribution for forbidden behavior. Even after a long period of friendly and coöperative behavior the girl may insist that she is coming to see us only because she is being forced to do so.

Treatment techniques vary according to individual needs, but some common procedures have developed which seem helpful in many cases. Most frequently it is worthwhile to focus upon the immediate surface problems which have brought the girl to court. Usually she has been placed on probation and is overtly resentful of this fact. I may begin therapy by telling the girl that our aim is not to take sides either with the family or with the

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court, but instead to help her get off probation by clearing up whatever situation brought her to court in the first place. An approach of this kind will usually release a flood of accusations directed largely against her mother, although in many cases the father is made a substitute target because of intense fear of the mother. The cathartic effect of this release provides some ameliorative effect of its own, and it may then become possible to focus upon problems in school or on the job. It is rare that our girls have made a satisfactory adjustment in either area.

Very soon evidence of transference becomes apparent. This transference has all the elements of intensity and instability that is characteristic of the adolescent period. The girl may ask for a mild favor or concession on the part of the therapist. The loan of carfare money or changing the time of an appointment may serve her the opportunity for finding out whether the therapist is really on her side. It is often helpful to accede to these requests and to maintain the positive transference without any interpretation.

It has also been found useful to limit the intensity of the transference by giving the girl a minimal amount of appropriate personal information about the therapist, when this question arises in treatment. For example, if I am taking a vacation, I may tell the girl where I am going and a little bit about the place. This kind of information has the effect of limiting to some extent the romantic fantasies which most adolescent girls tend to build up about a relatively unstructured relationship. This limiting of transference also reduces the patient's guilt and anxiety regarding Clinic attendance and thus permits closer attention to other reality problems. In so far as the therapist can give structure and reality meaning to the therapeutic relationship, he tends to minimize the projection (i.e., transference) of unconscious erotic feelings by the patient.

If some progress is achieved by these techniques it may then become possible to help the girl to adjust to some parental demands. The lowered intensity of the general home situation has by this time resolved some of the more blatant stresses. The girl is frequently told that she must recognize the fact that her parents do support her and are legally entitled to govern her behavior until she becomes of age and is able to support herself. If a favorable relationship with the therapist has been achieved, there is usually an acceptance of these remarks.

Our techniques are in general oriented toward assuming a stable parental rôle toward the girl. It has been found most helpful to take the part of a firm but kindly adult, who is benevolent but consistently authoritative in attitude. After parental relationships have improved to some extent the girl

may begin to bring up material which would lead to unconscious motivations and this area is approached slowly. With some girls the anxiety aroused by these unconscious problems provokes a flight into mental health, and therapy may well be terminated at this point. The girls who continue treatment in order to probe unconscious problems are usually those with rather well developed character neuroses or borderline schizophrenics, and these girls often present prominent sado-masochistic behavior involving promiscuity or prostitution. Some case material may further illustrate these problems.

Louise R. came to the attention of the court when she was 16 years old. She was brought to court because of continually staying out until two to four A.M., occasionally running away for as much as a week at a time and for using vile language toward her mother. Mrs. R. was a jealous, moralistic woman who was married for the third time, her first two husbands having died. Louise's father had died when she was four months old. There were no other siblings. Mrs. R. said that Louise was completely out of hand and she accused her daughter of promiscuous behavior and of striking her.

Upon referral to the Clinic, Louise appeared as a tall, attractive, maturely developed girl (*IQ* of 101) who spoke in a frank and open way but was resentful both toward her parents and the court. She was particularly bitter toward her stepfather who, she felt, had no right to tell her what to do. She insisted that she had never been promiscuous and had never really struck her mother except in partial self-defense. Mrs. R. had continually annoyed Louise by prying into her dates with boys, insisting that Louise was little better than a whore and at the same time warning her against sexual indulgence. Louise had already left school and held several jobs as a bus girl. She said that she usually was insulted by her bosses who made sexual advances or spoke harshly to her, and she usually left her job within a matter of weeks.

Louise was seen in therapy once a week for 16 months. For about the first eight to 10 months the storms at home continued but with gradually diminishing intensity and frequency. One of the major bones of contention was Louise's boy friend, Marty, who had been sent to a reform school for theft. Mrs. R. was extremely upset at the fact that Louise maintained contact with Marty and stated that she intended to marry him when he was released. The therapist kept showing Louise how these arguments at home served to keep her on probation and in trouble with the court.

It gradually became apparent that Louise's temper outbursts had started about the time that her mother married for the third time. It was also about this time that she started to go with Marty. Louise then described her mother's attachment to another man with whom she had gone prior to

her present marriage. This man had found it necessary to take a long trip and had asked Mrs. R. to wait for him. However, Mrs. R. was an extremely jealous person and continually accused him of having left her for other women. She finally could wait no longer and married Mr. R. Nevertheless, Louise felt that her mother was still sorry that she did not marry the man for whom she had been waiting.

It became obvious that Louise's waiting for Marty represented an unconscious desire to show her mother that she could do what her mother had failed to do, i.e., wait for a man whom she loved. However, as this parallel came closer to the surface, Louise's behavior improved in a striking way. Under our direct guidance and support she had undertaken and completed a secretarial course and she now got an office job with a large commercial firm. She now shied away from any discussion involving her mother, and spoke of how extremely happy she was with her work. She was making far more money than she ever had and found that she was able to accept many of her parents' unreasonable demands upon her. She was content to spend most of her time at home or with girl friends and now got along quite well with her mother and even with her stepfather. Mrs. R. became overly solicitous and protective, and in fact insisted upon kissing Louise each day before she left for work. Although many personality problems remained, Louise was poorly motivated for continuing treatment, and it was felt that our major goals had been accomplished.

To illustrate some of the problems and techniques of treating a more disturbed girl we present the case of Marjorie T. Marjorie was a moderately attractive Negro girl of 18 (*IQ* of 116) who came to the attention of the court because of a first offense in prostitution. She was well motivated for treatment and related to the therapist in both an intellectual and seductive way.

Marjorie described herself as having always been a decidedly seclusive girl who had done well in school but made no friends. She said that she liked to observe life objectively and that she hoped to become a writer. Marjorie was seen at the Clinic once a week for a period of eight months, and it took almost this amount of time to get a clear picture of her life behavior. At first she was difficult to follow in her associations and showed some pressure of speech. She dwelt at some length on early childhood memories and showed a striking lack of infantile amnesia.

Marjorie was the third of four children; her siblings were all boys. She had not been staying at home when arrested but had told her parents that she was married to George W., the man with whom she was living. Mar-

jorie explained this relationship in a blatantly illogical way. She said that while visiting George one night she had become so sick that she could not go home and so spent the night with him. The next day when she left for home and got near the house, she felt that she could never explain the situation to her parents and so went back to live with him. After this incident George became abusive and jealous toward her. He did not allow her to get clothes from home even though she had only one dress to wear and frequently he did not let her leave the house.

Her relationship with George had been a markedly ambivalent and sado-masochistic one. She loved him as she had never loved anyone else, but at the same time she hated him because of the way he treated her. She was passive and compliant in her overt behavior and accepted his beatings. However, she planned to kill him and put some sleeping pills in his coffee. Then she changed her mind, drank the coffee herself, but did not suffer any ill effect. Marjorie prostituted herself at George's insistence in order to provide him with money for drugs, since he was both an addict and seller of narcotics. George then became involved with the law and was sent to prison. Marjorie decided to prostitute herself one more time in order to get money to live by herself and then get a job. It was, of course, on this occasion that she was arrested.

Marjorie's parents had come from a highly moralistic background and expected her to be totally chaste. Her mother had continually pointed out the women in the neighborhood who had a shady reputation and warned her to avoid this road to degradation. Mr. T. was very strict and demanding in his attitudes and had beaten Marjorie savagely when she was a child.

The patient's early memories included her fears of being poisoned and of being abandoned by her mother. She also recalled that as a child she had thought that she was a boy and that she had a penis which was as yet flat and undeveloped.

Marjorie's course in treatment was an extremely stormy and uneven one. It was soon recognized that prostitution had served Marjorie as a means of getting even with both of her parents. The therapist pointed out that prostitution had also gotten Marjorie into a great deal of trouble with the law and had actually hurt her more than her parents.

After the patient had ventilated many of her feelings and early memories we began to focus more stringently upon her job situation. It then became clear that Marjorie had definite paranoid ideas regarding her employers and felt that they knew of her prostitution and would call the police or take sexual advantage of her. This material was dealt with largely in terms of telling Marjorie that,

although there might be some basis of fact in what she said, it would be necessary for her to continue working and to try to overlook some of these things.

A particularly acute episode of this kind occurred at the start of a menstrual period and Marjorie came to the office in a highly agitated and hyperactive state. She said that her boss had accused her of being seductive toward him and this had made her tremendously resentful, offended, and agitated (her own provocative rôle was clear in what she said but this, of course, was unrecognized by her). Marjorie had also been quite seductive toward me, but had denied any thoughts of this kind. She now said that she had not had time to eat, was hungry and offered me some candy she had brought. I accepted the candy without interpretation and dealt with the job episode as illustrating the fact that she would have to disregard any advances her boss made. The many interrelationships among Marjorie's menstruation, the candy offered me, the drugs supplied to George, and her early fears of being poisoned were not dealt with at all.

After this session Marjorie improved steadily in her vocational adjustment and was able to get the kind of job she wanted on her own initiative. However, she tended to take jobs which would be temporary and worked considerably below her own level of capability. Her social life remained rather barren, but she was able to capitalize on some intellectual interests. Subsequent follow-up indicated that Marjorie formed relationships with men who liked to gamble or drink. She was not interested in getting married and recognized the fact that she could relate only to men who seemed deviant or mildly asocial in some way.

In evaluating the factors influencing Marjorie's return from prostitution to a more satisfactory and socially acceptable work adjustment, it is felt that the therapeutic technique resembles that of Louise despite the wide differences in clinical symptoms. In both instances the patient's improvement was due in part to ventilation of hostility and other feelings towards the parents and in part represented an escape from insight regarding more incestuous material. Louise improved in her behavior when her own jealousy toward her mother became implicit in what she was saying. Marjorie improved when her own provocative rôle became implicit both on the job and in the transference. Both the jealousy and provocative behavior were accepted without interpretation. In Louise's case, acceptance was indicated by complimenting her on her vocational adjustment without pointing to its defensive aspect. In Marjorie's case, acceptance was signified by eating her candy without interpretation of its symbolic meaning.

These techniques are oriented toward limited goals which have been dictated both by practical administrative needs and also by the nature of the patients themselves. It may be argued that "deeper" insights might have provided a more beneficial effect than the limited interpretations given. I doubt that this would be true for the majority of girls seen at our Clinic, but it must be admitted that the personality of the therapist is a crucial element in work of this kind. Our point of view is that we are serving the community as well as the girl herself and that the needs of all are best met by promoting relatively stable relationships in the home and at work.

Essentially our technique involves the use of an unconscious incestuous conflict with the parent-therapist as a stimulus for initiating the adolescent's growth away from her mother. It will be recognized that this defensive flight from the parents is also prominent in the normal adolescent who does not come for psychotherapy. In this sense we are deliberately providing our patients with a significant relationship which is necessary to an adult development.

SUMMARY

This report describes psychotherapeutic techniques which have been found useful for dealing with adolescent girls in a court clinic. It has been found helpful deliberately to assume the rôle of a firm but benevolent parental figure and to limit the intensity of the transference. These girls are able to improve their life situations by developing some minimal insights into day-to-day problems and ventilating their feelings toward their family and toward the court. It has also been found that these patients can improve their adjustment by developing behavior which is a defense against understanding deeper unconscious problems. In general, our technique involves a cathartic working through of surface problems and the direct encouragement of subsequent defense formations.

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EFFECT OF ADRENALECTOMY ON ANXIETY MOTIVATED BEHAVIOR*¹

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A. INTRODUCTION

Although the influence of endocrine functions on behavior has long been recognized, there have been relatively few experiments that have attempted to establish just what these relationships are. It has been postulated by Solomon and Wynne (6) that certain endocrine reactions are particularly relevant to the learning of escape and avoidance reactions because they are a part of the physiology of the anxiety syndrome.

Mowrer (3) has suggested that in escape and avoidance situations, an animal learns two things: it learns to make the appropriate response which removes it from the noxious stimulus, and at the same time, it learns to be afraid. Essentially this means that the cues previously associated with pain tend to elicit an autonomic (and endocrine) response. This response is the anxiety syndrome, and the sensory effects of it make the animal uncomfortable and consequently act as a drive. Thus, the animal makes a response which removes it from the cues which tend to evoke the anxiety syndrome.

The fact that the secretions of the adrenal gland are a part of the anxiety syndrome is well established. It is also well established that the adrenalin duplicates the function of the sympathetic nervous system. Best and Taylor (2) write "... adrenalin acts only upon structures receiving sympathetic innervation and in a manner corresponding to the action of the sympathetic fibers themselves. In general, its effects imitate almost perfectly those evoked by stimulation of the sympathetic system. Its action, therefore, is said to be sympatho-mimetic." Thus, it seems reasonable to assume that if the adrenals are rendered non-functional, that there will be a consequent reduction in the intensity of the anxiety syndrome. This should then lead to the more rapid extinction of an anxiety motivated response. Solomon and Wynne (6) have, in fact, shown that when the intensity of the anxiety syndrome is reduced by

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sympathectomy, dogs extinguish an avoidance response more quickly than do control dogs.

The studies on adrenal weight offer indirect evidence on the relationship between the adrenal glands and emotional behavior. Rogers and Richter (5) showed that the adrenal glands of wild Norway rats are significantly heavier than those of domestic Norways. Yeakel and Rhoades (7) compared the weights of the adrenal glands of an emotional strain of rats with those of a non-emotional strain and found that the adrenal glands of the emotional strain were heavier than those of the non-emotional one.

It is the purpose of this study to attempt to clarify the relationship between adrenal functioning and anxiety motivated behavior. Specifically, it is hypothesized that an escape response will be learned less readily and extinguished more rapidly in adrenalectomized rats than it will be in normal control rats.

B. METHOD

1. *Subjects*

In this study 27 naïve, female, hooded rats from the colony of the Carnegie Institute of Technology were used. All Ss were between 114 and 122 days of age at the time of testing.

2. *Apparatus*

The apparatus used has been described in detail elsewhere (4). Briefly it consisted of an alley 10 inches wide, 35 inches long, with sides 16 inches high. There was a goal box in the front left-hand corner. The floor of the main alley was composed of two sections of brass rods, each section of which could be electrified separately, or both could be charged at the same time. The weight of the rat on either section of the grid activated a standard electric timer thus, indicating how much time the animal spent in each portion of the alley during any one trial. The goal box was provided with a guillotine door. Shock was provided by an electronic shocker with sufficient resistance built into the circuit to minimize individual resistance differences in the Ss. The intensity of shock used was 1 milliampere. This insured that all animals would make highly active avoidance responses whenever the grid was charged.

3. *Procedure*

Seventeen days prior to the beginning of the testing period, nine of the animals were operated on and a total bilateral adrenalectomy was performed, following the procedure described in Farris and Griffith (2). Nembutal

was used as an anesthetic. A sham operation was performed on nine *Ss*. The procedure for this operation was exactly the same as for the adrenalectomy. An incision was made in the skin and in the muscle tissue so that the adrenal glands were exposed. They were not, however, disturbed. During this time the non-operated control group of nine *Ss* remained undisturbed in their home cages. All animals were given free access to a salt solution of 26 gr. of salt to eight ounces of water. The adrenalectomized *Ss* were thus maintained without difficulty. Plain water and food were also available at all times in the home cages.

After a 10-day recovery period, all animals were placed in an open field situation for four minutes a day for seven days. These results are irrelevant to the current experiment.

Seventeen days after the operation, the training procedure was begun. The training trials for all groups were exactly the same. Each *S* was given 10 training trials. A training trial consisted of placing the *S* in the right-hand side of the box about three inches from the right and facing that end. The goal box door was closed. After 10 seconds, shock was applied to the entire grid floor and the goal box door was opened. Shock remained on until the *S* achieved the goal box and thus escaped shock. As soon as the *S* entered the goal, the goal box door was closed. Approximately 10 seconds elapsed between trials while the response was being recorded by *E*.

The extinction trials were the same as the training trials except that the grid was never charged and the goal box door was always open when the *S* was put into the box but was closed as soon as it entered the goal. It was assumed that the response of running to the goal box was extinguished when the *S* remained outside of it for two minutes.

Each animal was given 30 extinction trials immediately after the training trials. If the *S* did not meet the criterion within 30 trials, it was given 40 trials a day on subsequent days until it did.

All groups were tested for spontaneous recovery. As soon as the *S* reached the criterion, it was returned to the home cage until the following day. On the day after reaching criterion, it was again tested in exactly the same manner as before. If it made the appropriate response, it was run until it reached the criterion a second time.

C. RESULTS

The latencies required for the *Ss* to get from the hot grid into the goal box can serve as a measure of learning of the escape response. If the mean latencies for all the animals on each training trial are plotted, a typical learn-

ing curve is the result. The shapes of the curves for the three groups are essentially the same. The latencies become generally shorter as the number of trials is increased. The mean latency for the 10 training trials for the non-operated control group after the shock was turned on was 10.96 seconds. For the operated control group it was 12.09 seconds, and for the adrenalectomized group it was 11.73 seconds.

An analysis of variance indicated that the means of the three groups did not differ significantly from chance. These results are presented in Table 1.

The mean number of extinction trials for the non-operated control group was 26.33. For the operated control group it was 16.33 and for the adrenalectomized group it was 24.00.

TABLE 1
ANALYSIS OF VARIANCE OF THE MEAN LATENCIES DURING THE TRAINING TRIALS

Source	Sum sq.	df	Variance est.
Between	6.66	2	3.33
Within	1,154.35	27	42.75
Total	1,161.01	29	

$F = .078$, not significant at .05 level of confidence.

TABLE 2
ANALYSIS OF VARIANCE OF NUMBER OF TRIALS TO EXTINCTION

Source	Sum sq.	df	Variance est.
Between	492.66	2	246.33
Within	7,068.00	24	294.50
Total	7,560.66	26	

$F = .83$, not significant at .05 level of confidence.

An analysis of variance indicated that the means of the three groups did not differ significantly from chance. These results are presented in Table 2.

Sixty-six per cent of the animals in the non-operated control group showed spontaneous recovery. Thirty-three per cent in the operated control group, and 33 per cent in the adrenalectomized group showed spontaneous recovery. The differences between the percentages of the adrenalectomized group and the non-operated control group are not significant at the .05 level of confidence, $D/\sigma_{dp} = 1.44$.

D. DISCUSSION

According to these data, the hypothesis that an escape response will be learned less readily and extinguished more rapidly in adrenalectomized rats than in normal controls must be rejected. Normal Ss did not learn the problem any faster; they did not take any longer to extinguish it; nor did

they show any greater tendency toward spontaneous recovery than did the adrenalectomized Ss.

According to the anxiety hypothesis as suggested by Mowrer (3), the rats learned to run from the large alley into the escape box to escape from the pain of the shock. They also learned to be afraid of the large alley; i.e., the cues of the large alley evoked autonomic responses. The sensory effects of these autonomic processes then have drive value because they make the animal uncomfortable, and as a consequence, he tends to make escape responses that remove him from the presence of these cues. A part of the sympathetic syndrome is the secretion of adrenalin (1) which reinforces and duplicates the effects of the sympathetic system. Apparently if the anxiety hypothesis is valid [and there is support for it (6)] the secretion of adrenalin is not a necessary factor to the development of anxiety in this situation at least. It may well be that the functioning of the sympathetic system alone is sufficient to produce the anxiety from which the animal is motivated to escape.

This does not necessarily mean, of course, that adrenalin plays no part in the anxiety syndrome. It may be that in some situations both the sympathetic nervous system and the adrenals must be functioning to provide sufficiently intense sensory effects for anxiety to have motivational properties. In the learning of an avoidance response, for example, adrenalectomized animals, because the anxiety is less intense, and should tend to fade faster, may learn the problem less quickly than normal controls.

Further research with different types of escape responses as well as avoidance responses is clearly necessary to establish the part that the adrenal glands play in anxiety.

E. SUMMARY

Twenty-seven female hooded rats were used in this study. Nine animals were subjected to a bilateral, total, adrenalectomy. Nine were given the same operation except that the adrenals were not disturbed, and nine served as non-operated controls. All animals were then taught an escape response, and the response was extinguished in all Ss. The latencies for the training trials were recorded as were the number of trials to extinction. All subjects were also tested for spontaneous recovery.

The results show that the groups do not differ significantly on any of the three measures used.

It was concluded that the functioning of the adrenal glands is not critical to the learning or retention of this particular escape response.

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EFFECT OF ADRENALECTOMY ON EMOTIONAL ELIMINATION*¹

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A. INTRODUCTION

The fact that there is a relationship between emotional activity and the adrenal glands has long been known. In 1932 Cantril and Hunt (4) demonstrated the injection of adrenalin produced "cold" emotion. Landis and Hunt (2), after a similar experiment, came to the conclusion that in some cases at least, the injection of adrenalin was sufficient to provoke a true emotional experience in the subjects. Rogers and Richter (12) showed that the adrenal glands of wild Norway rats are significantly heavier than those of domestic Norways, and further that the variation was greatest in the size of the cortex of the gland. Yeakel and Rhoades (15) compared the weights of the adrenal glands of an emotional strain of rats with those of a non-emotional strain and found that the adrenal glands of the emotional strain were heavier than those of the non-emotional strain. Thus, again, a relationship between the adrenal glands and emotional behavior is demonstrated.

Emotional elimination has been considered to be a reasonably accurate indication of emotionality in the rat. Hall has suggested that it is related to fear (8) and Billingslea (1) has indicated that the more emotional rat (as determined by the Hall open field test) is more timid in the home cage and in the presence of the experimenter. Tryon, Tryon, and Kuznets (14) developed a rating scale designed to quantify emotional behavior in the rat. They report that emotional elimination in the female as determined by Hall's test correlates highly (.83) with their rating scale. In the male, however, the correlation reported is only .34. These authors conclude that their data generally support Hall's contention that emotional defecation is related to emotional excitability.

Whether or not high elimination in an open field situation is a valid indication of emotional excitability was initially questioned by O'Kelley (11). More

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recently Bindra and Thompson (2) found that emotional elimination was not correlated with either fearfulness or timidity as they measured it. The results of Hunt and Otis (9) agree that emotional defecation as measured by the open field test is not correlated with timidity. One of their experiments shows, however, that "defecation can serve to indicate conditioned emotional disturbance of the 'fear' or 'anxiety' type." It was observed to be a consistent component of a conditioned emotional response. They suggest that defecation may be clearly related to emotional behavior in the rat, but the relationship becomes reliable "only when the emotional disturbance is substantial and reasonably intense."

It is the purpose of this experiment to attempt to further clarify the relationship between adrenal functioning and emotional behavior using emotional elimination as a measure. Specifically it is hypothesized, since it has been shown that more emotional rats have heavier adrenal glands than non-emotional ones, that rats without adrenal glands will show less emotional responsiveness in the open field situation than will normal rats.

B. METHOD

1. *Subjects*

In this study 30 female hooded rats from the Carnegie Institute of Technology colony were used. All Ss were between 107 and 115 days of age at the time of testing.

2. *Apparatus*

The open field apparatus consisted of a table top covered with white oil cloth. It was 23 x 33 inches with sides of grey composition board 15 inches high. A 200-watt bulb was placed 23 inches above the table, and the table top was 29 inches above the floor.

3. *Procedure*

Ten days prior to the beginning of the testing period, 10 of the animals were operated on and a total bilateral adrenalectomy was performed, following the technique described in Farris and Griffith (7). Nembutal was used as an anesthetic. A sham operation was performed on 10 Ss. The procedure for this operation was exactly the same as for the adrenalectomy. An incision was made in the skin and in the muscle tissue so that the adrenal glands were exposed. They were not, however, disturbed. All Ss were then given a recovery period of 10 days before the test trials were begun. During this time the non-operated control group of 10 Ss remained undisturbed in their home cages. All animals were given free access to a salt solution of 26 gm.

of salt to eight ounces of water. The adrenalectomized Ss were thus maintained with no difficulty. Plain water and food were also available at all times in the home cages.

At the end of the 10-day post operative period, all Ss were given the open field test. Each animal was placed in the center of the open field for a four-minute period once a day for seven days. A record was kept of the number of fecal bolli produced. Between trials the sides were removed and the open field was washed with warm water and then allowed to dry.

C. RESULTS

There were two measures of emotional elimination used in the study: (a) the number of days on which a S defecated and (b) the total number of fecal bolli produced during all seven days. The mean number of days on which the subjects defecated were as follows: Non-Operated Group, .8; Operated Control Group, .4; Adrenalectomized Group, 2.7. The mean number of fecal bolli produced were as follows: Non-Operated Group, 3.7; Operated Control Group, 1.4; Adrenalectomized Group, 11.9.

TABLE 1
ANALYSIS OF VARIANCE OF NUMBER OF DAYS ON WHICH Ss DEFECATED

Source	Sum sq.	df	Variance est.
Between	30.20	2	15.10
Within	80.10	27	2.96
Total	110.30	29	

$F = 5.09$, significant at .05 level of confidence.

TABLE 2
ANALYSIS OF VARIANCE OF NUMBER OF FECAL BOLLI PRODUCED

Source	Sum sq.	df	Variance est.
Between	609.26	2	304.63
Within	1,649.40	27	61.09
Total	2,258.66	29	

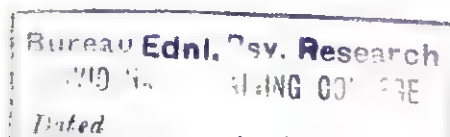
$F = 4.99$, significant at .05 level of confidence.

The results of an analysis of variance of these data are presented in Tables 1 and 2.

It will be noted that the F s for both analyses of variance are significant at the .05 level of confidence.

D. DISCUSSION

The data presented above clearly do not support the hypothesis that adrenalectomized animals show less emotional elimination than do normals. In fact,



just the opposite effect is demonstrated. Adrenalectomized animals defecate on significantly more days than do controls, and produce significantly more fecal bolli.

The reasons for these results are not immediately clear, and further experimentation will be necessary before they become meaningful. It might be hypothesized, however, that the results are due to the different and opposite functions of the two parts of the adrenal gland. Secher (13) reports a series of experiments that indicate that the adrenal cortex is more essential to sympathetic nerve transmission than is the adrenal medulla. Darrow and Gellhorn (5, 6) report that an excess of adrenalin has an inhibitory effect on the reflex excitability of the autonomic nervous system. Bulbring and Burn (3) present evidence to support Darrow and Gellhorn, and suggest that the depressing effect of excessive adrenalin may function as a depressive mechanism which regulates excessive sympathetic activity.

If the results of this experiment are considered in the light of the above findings the following interpretation may prove fruitful. The open field situation may, because of its strangeness to the organism illicit a fear reaction, a component of which is a stimulation of the adrenal gland. The secretions of the cortex tend to have a facilitative effect on the autonomic nervous system which causes anal sphincter dilation and thus fecal production. At the same time, however, the medullary secretion has a depressing effect on the autonomic system and as a consequence limits the extent of the emotional elimination. When the entire adrenal gland is removed both its facilitating and inhibiting effects are eliminated, and if the inhibiting effect is of greater consequence than the facilitating, the obtained results might be expected; i.e., more extensive and more frequent emotional elimination. Further study may help to verify this hypothesis or to indicate its limitations. This, of course, is only one hypothesis which is subject to experimental test. The actual relationship may be much more complex.

E. SUMMARY

Thirty female hooded rats were used in this study. Ten animals were subjected to a bilateral total adrenalectomy. Ten were given the same operation except that the adrenals were not disturbed, and 10 served as non-operated controls. All animals were then placed individually in an open field situation four minutes a day for seven days and the amount of emotional elimination was recorded.

The results show that adrenalectomized rats show significantly more emotional elimination than do the controls. An hypothesis is offered to explain these results.

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A FORMULA FOR SELECTING TOYS FOR NONDIRECTIVE PLAY THERAPY*¹

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A. PROBLEM

One of the important considerations in play therapy is the types of toys needed in the playroom. The problem of selecting proper play materials becomes apparent when only a limited budget is available. When a minimum of toys may be purchased, it is essential that toys making the greatest contribution to the therapeutic process are selected. When ample funds are available: "The inexperienced diagnostician and therapist . . . had a tendency to use everything that has ever been shown to be useful until . . . experience demonstrates which toys or what materials seem to tell the most about a child" (5, p. 761). A basis for selecting toys for therapy would seem to be desirable in either case.

B. CONSIDERATIONS

1. *Selection of Toys*

One of the first factors to be considered when purchasing toys for a playroom is that they should be selected, rather than accumulated. The importance of a "quantity and variety" of toys advocated by one nondirective play therapist (24) is in sharp contrast to the few toys utilized by Anna Freud (7). However, a psychoanalytically oriented play therapist indicates that the tendency to surround the child with toys is not singular to nondirective play therapy. For she reports finding "playrooms . . . filled with mountains of toys . . . of whose value no one was quite sure" (5, p. 762). Another psychoanalyst advocates "offering an ample choice of objects . . . fitting for every age level from preschool to teen age" (14, p. 11). Therapists of different schools, then, may be guilty of gathering, rather than collecting, toys.

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²The writer is indebted to one of his students, Rabbi Paul Reich, for calling his attention to the historical example of play diagnosis.

2. *Objective Method*

Another factor that merits the most careful consideration is the basis for selecting toys. The process of selecting toys should be an objective one. In this way the method, rather than the toys indicated by the method, may be applied in a variety of situations under numerous conditions. If toys are selected subjectively, it seems to the present writer that only the toys selected, and not the method of selection, can be empirically tested. That is to say, the toys will stand or fall when tested under different conditions. However, when the method of selecting toys is an objective one, then this method can have multiple application as well as revision.

One of the most objective accounts of psychotherapy is the verbatim protocol. David Levy, in discussing psychotherapy in adolescents, remarked on the necessity of the therapist exposing "his method verbatim . . . so that we might know from the record itself what went on from session to session. Such knowledge seems essential in assaying a case" (34, p. 14). The word-for-word account gives prominence to speech. The worth of talk in therapy would, then, seem to be a valuable consideration.

3. *Value of Talk*

Recent years have seen an emphasis on the value of talk in the psychotherapeutic relationship. For example, a comparative investigation of the psychoanalytic and nondirective schools revealed that in both of these methods the client did more than 70 per cent of the talking (11). In play therapy talk has been afforded similar prominence. One play therapist has reported that those children who can verbalize some insight as to the reason for their coming into the play situation "show the best progress" (1, p. 101). Another investigator seems to have raised talk to the status of a *sine qua non* in play therapy. He wrote: "Those children who transfer . . . the insolvability of their problems into the play situation . . . need to be induced . . . to reconsider, on a more verbal level, the constellations which have overwhelmed them in the past . . ." (31, pp. 71-72).

Several factors are probably responsible for such considerations being given to talk. In the first place, Freud, the perennial of the bibliographies of psychology, had much to say about speech. He showed the rôle of speech in analysis as a means of facilitating the patient's efforts to grasp physical or psychical reality. Later he indicated the importance of speech in bringing internal events into consciousness (28).

A second factor was the rise of objective investigations into the process of psychotherapy for teaching and research purposes. The importance of speech

has been increased by such interests (17, 27). For, typewritten verbatim style records of therapy could be completely and accurately obtained, and evaluated at leisure by a variety of nonsubjective methods. Hence, much of therapy, in text and experiment, has become almost synonymous with speech.

Such was not always the case. There are many kinds of psychotherapy, now largely of historical or anthropological interest, that do not require the patient to talk (10). Words are actually late developments of expression and communication. In the cultures of antiquity, the word is said to have served as the elucidation of gesture and posture. "Scholars agree that voice language is . . . a substitute for body language" (26, p. 572).

Despite Freud's pronouncements on the value of speech and his employment of verbatim style protocols (8), the young child frequently remains a nonverbal creature. Indeed, Vigotsky (32) intimates that children may prefer to conceal their feelings and fantasies in unvoiced speech. Many play therapists, consequently, have come to share the sentiment that it can be good for a child to be properly and truly silent in the playroom. One therapist has noted that some children "show remarkable improvement in their symptoms and behavior when there has been a minimal amount of . . . conversation about their problems or their inner thought processes" (29, p. 591).

However, an examination of such cases, i.e., children who do not speak in play therapy, reveals that such children "are usually presented . . . in the guise of a unique, single case history" (21). It is to be noted that play therapy and not play diagnosis is being discussed here. In play diagnosis speech is not important. The history of play diagnosis stretches into antiquity, when actions truly spoke louder than words. A play diagnosis by "all the wise men of Egypt . . . and the angel Gabriel . . . disguised as one of them" may serve as an example. These experts diagnosed the behavior of a three-year-old, Moses, according to an account based on the *Canticles Rabba* of the sixth century, as he placed Pharaoh's crown on his own head. The king and his attendants were terrified as they feared this act presaged the usurpation of Pharaoh's power. Gabriel proposed a diagnostic play situation involving a minimum of easily available equipment, i.e., an onyx stone and a live coal. These objects were placed before the child Moses. Hypotheses were proposed and accepted: (a) If the child grasped the onyx he would be shown to act with purpose. Hence, his seizure of the crown would have been a meaningful act. (b) If he seized the live coal he would be diagnosed as an impulsive, but witless babe.

Moses tried to seize the cold stone, but Gabriel, wishing to influence the outcome and arrive at a predetermined diagnosis, placed the child's hand

on the live coal. Moses, apparently now operating from the cue furnished by the examiner, touched the coal to his mouth and burned his lips and tongue. Thus, he lived, but all his life was slow of speech (9, pp. 272-274).

Other examples, methodologically more sophisticated, of play diagnosis are discussed elsewhere (23). Although play has interested people of many lands and cultures since the time of Aristotle (20), play therapy cannot be said to go further back than Rousseau's *Emile* of 1762 (18). Play therapy, then, is of much more recent origin than play diagnosis and generally has come to involve conversation. For the latter reason, children who do not speak in play therapy are unique.

The real problem of determining what is happening to the child who does not speak has been clearly indicated by Axline. She recounted the story of a little Negro boy who, week after week, sat down, tilted back his chair, propped his feet on a table, folded his arms, and just sat. Naturally, many unasked questions crossed the therapist's mind. Just before the therapist was about to prompt this child, the boy smiled, squared his shoulders and remarked, "I've been playing White Man!" Axline poignantly asks, "Who can tell what this experience meant to that child? How can we evaluate the effectiveness of such a play experience?" (4, p. 6).

It is possible for play therapy to be therapeutic even though the child does not speak. However, as Axline's queries suggest, it is as yet impossible to evaluate the process in such cases. Hence, in establishing a method to select toys for play therapy nontalking children cannot yet be included, even though they are encountered in nondirective play therapy. An empirical formula cannot admit subjective elements into its composition.

4. *Age of Children*

Another factor that must be considered is the age of the children who will respond in the play therapy situation. A review of the literature on the suitability of children at different ages for play therapy, appearing in this JOURNAL (21), revealed that most investigators set 12 years as the upper age limit for successful play therapy. A study of success in child therapy, not reported in those previously cited, indicated that: "Therapy with children over the age of 12 was conspicuously less successful than with children under 12" (6, p. 175). This important finding was based on 70 children treated by eight different therapists. Unfortunately, for present purposes, the writer did not indicate what type of child therapy was employed, other than that it was "individual treatment." The present writer (21), utilizing nondirective play therapy, has reported that 12-year-old chil-

dren did not seem to respond to current nondirective methods with the same verbal vigor as younger children. In view of the quite general agreement that play therapy, presumably of all schools, can be of benefit to children 12 years of age, that age would still seem to be suitable as an upper limit for subjects in a study designed to develop a method of toy selection. The lower limit of age may suitably be established at approximately four years. It has been noted that the three-year-old child finds it difficult to talk and act simultaneously (13). Since the present interest is in play therapy, rather than in play diagnosis, talking becomes objectively important. The four-year-old child can perform two simultaneous motor acts (13). Hence, children of that age make suitable younger subjects for an investigation of a method of selecting toys.

5. *Attention Span*

Sex and age have for long been regarded as important considerations in investigations of children's play. Many investigations utilized the concept of attention span, i.e., the length of time a child will concentrate on a play task. In general, previous studies gave the impression that attention span varied with sex, age, and with type of play material. A recent and well formulated study, reported in this JOURNAL (25) tends to negate these earlier concepts. Moyer and Gilmer found "no regular increase of attention span from year to year" (25, p. 198). Only one toy yielded a "sex difference of any appreciable degree of significance" (25, p. 196). The authors conclude that the concept of attention span is meaningless since its measure depends on selecting the right toy or play material for the right age. The much investigated concept of attention span may be less appropriate for indicating the therapeutic value of toys than a procedure involving the child's conversation.

6. *The Value of Toys*

There is no doubt that the playroom should be supplied with materials of proven value from a clinical point of view (12). Yet there have been few psychotherapeutic evaluations of material presented (5, 19).

Van Alstyne (30) undertook to discover what differences would be observed in the use of certain play materials in nursery school and kindergarten free play situations. She found that certain materials appeared to have considerably more conversation value than others. The materials highest in conversational value seemed to be: dishes, hollow blocks, doll corner, wagon, parallel bars, telephone, blocks, colored cubes, balls, crayons, and clay. She reported further that the similarities between boys and girls in regard to their choice of play materials were greater than the differences.

A study of the contribution of toys to psychoanalytic diagnosis, not therapy, has recently appeared. The subjects consisted of 79 boys and 21 girls ranging in age from 2 to 12 years, and in intelligence "from grossly retarded up to superior" (5, p. 763). As has been noted, speech is not particularly important in play diagnosis, hence, it is not surprising to find that the investigator was not concerned with speech. The examiner's notes indicated: (a) which toys were used, (b) which toy was first choice, and (c) the manner in which the toys were used. "On a . . . subjective level the examiner then tried to determine what sort of dynamic information could be interpreted from the play" (5, p. 764).

Since the writer herself concludes that these categories "have not been very valuable" (5, p. 769), extended comment on her investigation would seem to be unwarranted. Even so, it should be noted that because of the conditions of the study no data on sand or water play could be obtained.

Three other papers (19, 22, 23) on the question of toys have seemed to indicate that the kinds of toys used in nondirective play therapy have been established by inference rather than by investigation. If this were true it would mean that the published lists of toys recommended for the playroom would not necessarily be helpful in selecting the most advantageous toys. Evidently the quantification of a problem formerly treated largely on an intuitive basis would be a desirable step.

C. METHOD

One of the papers on toys (19) used the Borke Categories to analyze 4,092 statements made by children in nondirective play therapy. The categories were also rated on the basis of their expressiveness. A one-to-five scale was employed by three judges experienced in play therapy. A rating of *one* indicated the judges regarded the category as being very revealing of the child's feelings and attitudes. A rating of *three* meant that the judges considered the category as being neither revealing nor unrevealing of the child's feelings. A rating of *five* meant that the category so rated was held to be very unrevealing.

The development and reliability of these categories have been presented elsewhere (15, 17). Categories *A* through *W* have been published in full in this JOURNAL (17) and a brief description of Categories *A* through *U*, with the judges' mean rating, are available (19). Category *V*, i.e., sound effects, received a mean rating of *four* and Category *W*, i.e., mumbling or talking to self, was rated as *five*. It does not seem necessary to present the overlapping information here.

A previous investigation (19) used more than 60 different types of toys and play materials. Some of the toys were recommended in published lists. Other toys either did not appear on the lists or were specifically negated. For purposes of that experiment it was necessary to tabulate and categorize the statements made by each child as he played with various materials. These data were not published.

It has seemed to the present writer that a consideration of those unpublished data would afford an empirical indication of the expressive value of toys in nondirective play therapy.

1. *Subjects*

The verbatim style statements utilized in the present investigation were those of 20 children selected as being chronologically, socially, and intellectually satisfactory. A child considered chronologically representative could not vary more than four months from the age of 4, 6, 8, 10, or 12 years. There were two boys and two girls at each age level. Normal social adjustment was determined by an examination of cumulative records and by interviews with the children's teachers. To be considered intellectually satisfactory a child's Stanford-Binet *IQ* score could not vary more than one sigma from an *IQ* of 100. The last two requirements were established in an attempt to circumvent the possible influence of serious behavior problems and extremely high and low intelligence on the types of statements children might make and the activities in which they might engage.

2. *Therapy*

Three, one-hour, individual nondirective play therapy sessions were held with each child by the same therapist, in the same room, with the same toys (or similar ones) available for each session. To simulate the actual nondirective play therapy process, the children were not informed in advance that the contacts would be limited to three sessions.

D. RESULTS

All of the toys were ranked on two bases. These bases were the total number of statements made while the children used particular toys and the variety of categories into which the statements fell. For example, children made 533 statements while playing with the doll house, family, and furniture. The nature of these statements was described by 19 different Borke Categories. This item ranked as one in number of statements, and as 1.5 in category variety.

A rho comparison of the statement and category ranking of all the toys resulted in a figure of .96. This figure was significant at better than the one per cent level of confidence. It indicated a very dependable relationship between the rankings. It suggested that it made little difference whether the toys were ranked as to the frequency of statements made while they were used, or by the variety of categories the statements fell into.

However, it is quite possible that toys not among those presently considered might encourage a large number of statements that could all fall into a limited number of categories. For instance, a fascinating mechanical toy could be very attractive to children. Most of the statements made while using such a toy might be requests for information. Such statements would be classified as *P*. Category *P* has been rated as 4, or unrevealing. Use of another toy might result in a few statements spread over a wide range of categories.

Ranking by number of statements or by variety of categories does not seem to be adequate. Therefore a method was devised which took both factors into consideration. This method is called the verbal index, or VI. The formula is:

$$VI = \frac{\Sigma VRS}{1} + \frac{\Sigma RS}{2} + \frac{\Sigma Nu}{3} + \frac{\Sigma U}{4} + \frac{\Sigma VU}{5}.$$

The ΣVRS stands for the sum of the very revealing statements; ΣRS for the sum of the revealing statements, etc. The sum of each of these types of statements is divided by the judges' rating of the categories into which such statements fall. This formula considers both the number of statements and their expressiveness. For instance, when the number of statements made while playing with water pistols was considered, that toy had a rank of 37. Yet it only had a verbal index of 2. When ranked by VI it was in the 47th place.

Twenty-eight toys with a VI of 10 or above are listed in Table 1. The published source of each toy is also indicated.

The toys in Table 1 would seem to offer the "quantity and variety" deemed advisable by a recent nondirective play therapist (24, p. 207). It is to be noted that six of the toys in the list of toys with the highest VI have appeared on none of the published lists of playroom toys utilized in the present investigation. One of the toys, the checker game, has even been cautioned against (3). Yet, an empirical investigation revealed that the checker game has a slightly superior VI to the highly recommended toy soldiers.

Other toys appearing in published lists have even lower VI's. Such toys,

with VI's of 7 to 0, include cups and saucers, pencil, boats, rubber knife, clothesline and pins, airplanes, pegboard, rubber hatchet, paper dolls, spoons, mallet, telephone, water pistols, cloth or rags, broom, doll bedding, doll bed, and scissors.

TABLE 1
RANK ORDER ARRANGEMENT OF 28 BEST TOYS OF THE 62 TOYS EMPIRICALLY EXAMINED:
TOYS ARE RANKED ON THE BASIS OF THEIR OBTAINED VERBAL INDEX

Toy	Rec. By	VI	Toy	Rec. By	VI
Doll House, Family, and Furniture	A, Ax, M, W*	212	Bubble Goo	None	26
Poster Paints,			Coffee Pot	None	24
Brushes, Paper,			Cord, Rope	None	23
Easel, and Jars	A, Ax, M, W	186	Animals	A, Ax	18
Sandbox	Ax, M	99	Wood, Asso.	M	16
Blackboard and			Balls, Asso.	None	17
Colored Chalk	**	80	Crayons	A, Ax, M, W	16
Cap Guns and			Baby Dolls	A, Ax, M, W	16
Caps	A, Ax, M, W	59	Bow and Arrows	W	15
Coloring Books	None	43	Clay	A, Ax, M, W	14
Hand Puppets	Ax, M	36	Cars	A, Ax, M	13
Balloons	M	36	Checkers	None	12
Nursing Bottles	Ax, M	34	Shovel	M	12
Films and Viewer	None	34	Masks	M	11
Water in Basin	Ax, M	32	Toy Soldiers	A, Ax, M, W	10
Pop Guns	A, Ax, M, W	29	Water Colors	A, Ax, M, W	10

*A—Arthur (2), Ax—Axline (3), M—Moustakas (24), W—Watson (33).

**While blackboard and chalk are not specifically recommended, they are similar to crayons, paints, and paper which are all highly recommended.

Toys with obtained VI's of 1 or 0 are: Comic books, cloths and rags, doll bedding, broom, play money, man's sweater, paper pumpkin, scissors, doll bed, ladies' shoes, and washboard.

There is a sprinkling of recommended toys appearing in this last list. These toys evidently contribute very little to encouraging expressive verbalization in the nondirective play therapy room.

E. USES OF THE VI FORMULA

1. The VI formula can be used to determine the verbal expressive value of toys currently in the playroom. As can be seen from an examination of the above lists of toys, some toys highly regarded by nondirective play therapists do not contribute much to encouraging the child to verbally express himself. The toy telephone, for example, has been highly regarded. It is prominently listed among essential playroom equipment by modern nondirective play therapists (3, 24). The telephone would appear to be particularly valuable as an expressive toy. The development of verbalized insight was of particular importance in client-centered therapy with adults

(16). In nondirective play therapy the assumption was that use of the telephone would encourage the child to make his feelings and attitudes known verbally. Such verbalizations by the child should furnish the nondirective therapist with splendid opportunities for therapeutic reflection.

Yet the telephone appears among the toys with a VI of 7 or less. It would seem that while the toy telephone has a high "theoretical" value it has a negligible empirical value. Other recommended toys in the above lists of toys could perhaps be profitably removed from the playroom.

2. The VI formula can be used to determine whether or not a newly purchased toy will carry its own weight in the therapeutic playroom. Simply by taking verbatim records of the statements made by children while playing with the new toy as well as the toys already in the playroom, the VI of the new toy may be compared with the VI of toys known to be successful. If the VI was not up to the average of the other toys the new toy might be removed immediately. Such usage of the VI formula would prevent a playroom from becoming crowded with useless toys.

3. Specific types of toys can be contrasted by means of the VI formula and the best toy selected. For example toy guns are well recommended (2, 3, 24, 33). Yet it is not specified whether cap guns, pop guns, or water pistols are meant. As can be seen from an examination of Table 1 and the above lists of toys, cap guns have a VI of 59, pop guns a VI of 29, and water pistols have a verbal index of less than 10. Cap guns are obviously superior in the present study. It would seem to be necessary to specify cap guns rather than use the generic term, toy gun in selecting playroom toys.

4. The VI formula may also be used to select an absolute minimum of toys for a visiting teacher's or psychologist's traveling kit. The toys in the suit case recommended by Axline (3), with the exception of the toy telephone, all have a VI of 10 or above.

F. SUMMARY

A formula was presented enabling the selection of toys for nondirective play therapy on an objective rather than an inferential basis. This formula was called the verbal index and considered both the number of statements made while a particular toy was used and the expressive variety of the statements. Use of the verbal index formula was suggested for:

1. Determining the verbal expressive value of toys presently in non-directive playrooms.
2. When deciding upon including new toys in the playroom.
3. In selecting specific kinds of toys rather than general types of toys.

4. In selecting a minimum of the most verbally expressive toys. Twenty-eight types of play equipment receiving verbal indexes of 10 or above were enumerated. They are suggested as the toy nucleus of a nondirective playroom. Eleven toys receiving verbal indexes of one or below were listed. It was suggested that such toys be avoided even though some of them have been recommended in published lists.

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HUNGER MOTIVATION IN THE RAT FOLLOWING LOCAL APPLICATION OF COBALT-60*

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A. INTRODUCTION

An interesting facet of the study of radiobiology has been the relative insensitivity of nervous tissue and behavioral functions to irradiation. Slight impairment has, however, been reported by Furchtgott (7) for discrimination learning in the rat, and by Fields (5) for maze learning. Levinson (15) found that maze learning was greatly impaired in the rat when irradiation was effected during fetal stages of development. These studies, like most that have employed behavioral measures, have used X-rays as the energy source.

The present availability of inexpensive, compact sources in the form of isotopes, permits the study of continuous irradiation during behavior in a relatively unrestricted environment. To our knowledge, the first attempt to modify complex behavior by use of artificially produced radioisotopes was the investigation by Cannon (3). He placed over the brain of experimental animals small cobalt-60 sources, which were left there throughout a maze learning and retention period. Horton (12), also using Co-60 (approximately 40 microcuries per animal, acting over 23 days), studied its effect on brightness discrimination learning. Although he found no influence on error scores, there was a slightly greater response latency in experimental animals than in controls. This is in keeping with the known depression in activity level following X-irradiation—Jones, *et al.* (13). Harlow, Schiltz, and Settlage (11) have reported loss of several learned behaviors in two monkeys after production of brain lesions by Co-60 prior to testing.

A possible complication in studying irradiation and learning, is that the radioactivity may not be neutral to the type of motivation used. In fact, it has repeatedly been shown that high-energy radiation may interact with both hunger and thirst (8). Ely and Ross (4) demonstrated that neutron body

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irradiation in rats depressed food intake and increased residual stomach fluid volume in free drinking situations. Furchtgott (6), likewise, showed that whole-body X-irradiation in single doses of 200 and 300 *r* temporarily depressed hunger in the rat. Nims and Sutton (17) found polydipsia after single-irradiation treatments, and observed that in experimental animals the time lapse prior to maximum weight loss was a linear function of dose between 50 and 600 *r*. It has even been possible to show decreased food and water consumption within an 8-hr. irradiation period—Garcia, *et al.* (9).

The present investigation was concerned with effects on food intake and body weight of small Co-60 sources implanted over the skull in the rat.

B. METHOD

The study was begun with 26 female albino rats not previously used in experimental work. These ranged between 74 and 132 grams in weight (mean 94.8) at the beginning of the experiment.

During both the pre-operative and post-operative series of days animals were fed individually in one-gallon metal cans covered with hardware cloth. Each can contained Purina Laboratory Chow pellets in an amount greater than an animal could eat in a test period. Days 1 and 2 were used as an adaptation period and no record of food consumption was kept. Animals were approximately 23 hours hungry on each of the two days when placed in the metal containers and were allowed to eat for one hour.

Eating records were kept for all animals on Days 3 through 7. During this period the animals were allowed to eat for two hours each day. The amount of food consumed was determined by weighing the cans containing food before eating and at the end of the eating session after droppings had been removed. Animals were weighed on Days 3, 5, and 7. Using individual averages of body weight and food consumption for the five-day period, nine pairs of animals were matched in terms of grams eaten per gram body weight, and experimental and control groups determined by random assignment. The groups were separately housed in two adjacent living cages with food continuously present.

On the twenty-fourth day (16 days after matching) pellets of paraffin containing radioactive cobalt were surgically inserted between the skin and the skull in the region of the neocortex in all experimentals. Individual pellets were approximately 5 x 7 x 2 mm. in size and gave counts representing 35 to 42 microcuries (mean—38.9).

Paraffin pellets placed in the control animals were similar in size to those used with the experimentals but contained non-radioactive cobalt. One con-

trol animal was lost during the operative procedure, but this loss did not materially affect equality of the groups in terms of initial matching. Grams of food consumed per gram body weight for the matching period were for the nine experimentals, mean—0.387, *SD*—.0037; and for the eight controls, mean—.0395, *SD*—.0030.

Unlimited eating was allowed during the 24-hour period following the operation. All food was then removed for 23 hours immediately prior to the first post-operative test trial. Animals were allowed to eat for one hour per day for 10 days. Food consumption was recorded on irradiation Days 2-11, with the exception of Day 5, and body weights taken on Days 2, 4, 7, 9, and 11. Because the pellets of two experimental animals had worked up through the skin and were in danger of being lost, these animals were eliminated at the termination of Days 9 and 11 respectively.

C. RESULTS

The two groups were not significantly differentiated in terms of food consumption on any of the irradiation days. A comparison of mean body weight gains from the first post-operative test day (irradiation Day 2) to later days of treatment, did however, show significant impairment for experimental animals compared to controls on irradiation Day 7 (Table 1).

TABLE 1
MEAN BODY WEIGHT GAINS FROM SECOND POST-OPERATIVE DAY TO LATER TEST DAYS

	<i>N</i>	Irradiated Mean	<i>SD</i>	<i>N</i>	Non-irradiated Mean	<i>SD</i>	<i>t</i>
Days 2-4	9	1.1	2.1	8	2.1	3.1	1.0
Days 2-7	9	-2.9	1.4	8	1.4	3.1	3.5*
Days 2-9	8	-2.1	4.2	8	0.4	2.4	1.4
Days 2-11	7	-4.3	3.4	8	-0.2	3.5	2.1

*Significant at .005 level.

A question arises as to whether the different body weight gains from Days 2 to 7 could be accounted for in terms of group weight differences on Day 2. However, the Day 2 and 7 mean weights were: experimentals, 119.9_{g.} and 117.0_{g.}; controls, 121.6_{g.} and 123.0_{g.} While the control mean gain was not in itself significant, the experimental mean loss was significant at the .001 level. That the effect on weight had not completely disappeared by the end of the study is suggested by the fact that on Day 11 the control group was at about its starting weight, and the seven surviving experimental animals showed a persisting weight loss, significant at the .02 level.

D. DISCUSSION

The implantation of isotopes with relatively long half-lives furnishes a technique for continually stimulating the brain of the unrestricted animal. Like the techniques developed by Loucks (16) and Gengerelli and Kallejian (10), the present method, although less precise than the latter two, frees the experimenter from some of the mechanical restrictions imposed by other stimulation devices. More localized stimulation could be obtained by placing on the cortex small amounts of pure beta emitters, although actual test would be necessary to determine if the effect could be made large enough to be reflected in behavior.

Present results suggest that it would not be safe to assume that the low dose of radiation used could influence other behaviors independently of hunger motivation. While food consumption was not significantly altered, it would seem that even the small differential weight gain could be associated with an effective hunger difference over the time interval studied. The decision as to how important such a possible small difference would be in other research would depend on the nature of the problem. Whether weight gains would become equalized for the two groups over a longer period of constant irradiation, as they frequently do after single exposures to radioactivity (4, 9), remains to be determined. The possibility of later weight equalization, at least for small Co-60 implants, is suggested in the data reported by Boche (2), where rats receiving X-irradiation at doses of 0.1, 0.5, and 1.0 r/day over 100 weeks were in general not distinguishable from controls in terms of mean body weight. This was especially apparent in the weight curves up to about 50 weeks. In considering whether irradiation may be changing hunger motivation, however, one cannot rely wholly on a measure of gross caloric intake, for Leary (14) has demonstrated shifts in food preference of monkeys after X-irradiation. That continuous low-level irradiation concentrated primarily in the head influenced body weight in the present study is related to the findings of Smith and Thyree (18) showing body weight changes following single X-irradiation of separate body regions, one of which was the head.

While stimulation by isotopes opens up some interesting possibilities, there are also severe limitations to this methodology. With gamma sources, like Co-60, local application will still give some general body irradiation. Placing the source near the cerebral cortex produces a substantial energy flux reaching lower brain centers, pituitary, thyroid and other tissues. Because of the delayed wound healing which often accompanies irradiation, it must be anticipated that differences between experimental and control animals may

be conditioned by greater concentrations in the former of toxic by-products at the site of surgical implantation. This is of special concern in investigations like the present, where the radioactive source is near the brain and behavioral measures are being taken. In studies involving hunger, it should also be borne in mind that starvation has been shown to change sensitivity to irradiation—Allen (1).

E. SUMMARY

Paraffin pellets of Co-60 averaging 39 microcuries were inserted under the skin over the neocortex in experimental rats in a study of hunger motivation. These animals, compared to controls receiving non-radioactive cobalt in paraffin, showed a small but significant impairment in body weight between second and seventh irradiation days. Food consumption was not significantly altered. Possibilities and limitations of isotopes as stimulation sources in behavior study are discussed.

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AN ANALYSIS OF MANIFEST CONTENT OF THE EARLIEST MEMORIES OF CHILDREN*

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A. PROBLEM

Several recent papers (1, 2, 4, 5), devoted to the study of the earliest memories of individuals, present a number of case studies and show how the memory is related either to the dynamics and/or the diagnosis of the subjects. None of these, however, approach the problem with a systematic investigation of the manifest content of such data derived from a large number of subjects.² It was believed that such an analysis might prove fruitful in supplementing the knowledge already obtained through the case history method. Therefore, our attention was directed towards some attributes of the memory in its relationship to certain group characteristics. The present study differs from previous reports in several respects: (a) the use of a relatively large number of subjects; (b) the analysis of the manifest characteristics; (c) the establishment of a model with which data from other subjects might be compared; (d) the search for trends both within and between sub-groups; and (e) the testing of certain hypotheses derived from psychodynamic theory.

B. SUBJECTS AND PROCEDURE

The group of subjects consists of 95 children with a mean age of 11.9, and a standard deviation of 3.8. The ages range from 5 years, 0 months to 18 years, 5 months. Of the total group, 44 are male and 51 female. Forty-nine were seen at one of two outpatient psychiatric clinics for children, and 41 were interviewed at a children's residential institution.³ Five subjects

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²Although Friedman (4) does indicate that her population consisted of 100 patients, she does not present a statistical analysis of her data.

³Psychiatric Clinic for Children (University of Washington and University of Cincinnati) and Seattle Children's Home, respectively. The population at the latter institution is composed of children who have been unable to make an adequate adjustment in their own or in foster homes. Thus they can be considered to be emotionally disturbed.

were private patients of the authors. Although no separate count was made, it was obvious in tabulating the above figures that the preponderance of the children in the clinics was male, and in the institution was female. This is a function of the more frequent referral of boys as behavior problems to the clinics as well as that at the time the study was made at the residential institution there was no caseworker for the male wing and these children, in general, were not interrogated. From the 95 subjects, a total of 104 memories were recorded, some subjects having responded with more than one memory. In the clinics, the earliest memory was requested usually in the first, occasionally in the second, diagnostic interview. At the residential home the subjects were called into the caseworker's office individually for the expressed purpose of obtaining the data. These latter subjects all had been in residence at the institution and had had previous relationships with the caseworker.

The memories were requested by the individuals in a standard manner. The instructions were as follows:

I have been interested in the first things that children remember and wonder what your earliest memory is—the very first thing you can remember happening. (The subject's response was recorded verbatim. If he was unable to answer, gave an evasive reply or said that he could not remember, this was recorded and a second request was made.) I mean the very first thing that you ever remembered happening in your whole life. (If no response was elicited, a third exhortation was made.) Surely you remember something. Everyone has a first memory in his life. (If after the third try, the child gave no response, this fact was noted and the inquiry ceased. Only material obtained from these three questions was included as a memory.)

After the memory had been obtained, the subject was asked how old he was when it had occurred. Each memory was analyzed to determine the presence and/or the frequency of the following characteristics:

- (1) Age.
- (2) Sex.
- (3) Institutional or clinic subject.
- (4) Numbers of exhortations required to obtain memory.
- (5) Age ascribed to time of occurrence of memory.
- (6) Locations mentioned.
- (7) References to themselves.
 - a. First person singular ("I," "me," "mine," "my").
 - b. First person plural ("we," "us," "our," "ours").
- (8) References to others.
- (9) Activity of subject.
 - a. Muscular.
 - b. Non-muscular (e.g., viewing, listening, etc.).

- (10) Activity of others.
 - a. Muscular.
 - b. Non-muscular.
- (11) Parts of body mentioned.
- (12) Illness.
 - a. To self.
 - b. To others.
 - c. Severity.
- (13) Injury.
 - a. To self.
 - b. To others.
 - c. Severity.
- (14) Death.
 - a. Who.
 - b. Cause.
- (15) Animals.
- (16) Inanimate objects.
- (17) Physical destructiveness.

C. RESULTS

Of the total group, 67 subjects had to be asked for an early memory once only; 17 twice; and 11, three times. (Six of this latter gave no memory even with three requests.)

TABLE 1
AGE OF OCCURRENCE OF MEMORY

Age in years	Frequency
Less than 1	5
1-2	9
2-3	9
3-4	25
4-5	16
5-6	14
6-7	3
7-8	3
8-9	3
9-10	1
10	1
No age specified	12
Undetermined	5
Total	104

Although the subjects ranged in age from 5 years, 0 months to 18 years, 5 months as mentioned previously, the ages of the memory ranged from infancy to 10 years. The breakdown is indicated in Table 1.

The ages specified by the subjects at the time of the occurrence of the memory clustered between two and six inclusive (64 of the 104 memories

ranged between these two age levels). It would appear, then, that for these subjects these years (two to six) are important in terms of presenting significant events to be remembered later in life as a representative model of childhood experience. Even if the memories that are presented are screened or the ages presented are not accurately recollected, it is noteworthy that the individuals present these ages as the date of occurrence of a memorable event in their lives. Since this age period roughly coincides with the oedipal years, this might point up the importance of this time in the development of personality as stressed in psychoanalytic theory.

Inspection of the scattergram using the variable of the current age of the subject and the age given as the time of the occurrence of the earliest memory indicated a low or zero correlation.

The breakdown of locations mentioned by the subjects are presented in Table 2. To test the hypothesis that a preponderance of these frequencies

TABLE 2
LOCATION MENTIONED IN MEMORY

Category	Frequency
Geographical	21
Dwelling (including institution)	13
School	8
Vehicle	3
Hospital	4
Party	2
Street (non-specific)	4
Playground (non-specific)	1
Garage	1
Basket	1
Army	1
Seat	2
Basement store	1
Fire escape	1
Movie	1
No locations mentioned	40
Total number of memories	104

fall within the geographical sub-category when location was mentioned, the following analysis was done: a distribution with equal frequencies was postulated. By the use of the chi-square technique the obtained distribution (excluding "no location") was compared with this hypothetical one. The value of 107.91, with 12 degrees of freedom, is significant well beyond the .01 level of confidence and, therefore, the obtained distribution can be considered as not being attributable to chance. It is recognized that this finding is in part at least an artifact of the definition of the term "location." Or-

dinarily the terms "geographical" and "location" are roughly synonymous. As used here, the term "geographical" refers to any specific and fixed topographical place whereas "location" refers to a place that someone might be. This did allow for categories other than topographical.

A further sub-analysis was done to test the hypothesis that temporary removal from customary living quarters during early childhood would increase the likelihood of mentioning of geographic or home location on the assumption that these locations would have more significance for the displaced child. There was, however, no difference between the clinic and institutional groups on this score. Both groups mentioned these places equally frequently.

The remainder of the categories referred to above were analyzed in a similar manner to the two previously described categories, age of recollection, and location. The results showed no clear-cut consistencies for the entire group nor were there discernible trends when the data were broken down according to sex or whether the subjects were from the clinic or the institutional group. Tables 3 through 9 contain the majority of the obtained results. A few specific comments will be made by way of illustration here. Frequently there was such a wide variety of responses within any individual

TABLE 3
FREQUENCY AND PER CENT OF MEMORIES CONTAINING SELF-REFERENCES

	Clinic children	Institutional children
First person singular	42 (71%)	39 (90%)
First person plural	46 (78%)	33 (73%)

TABLE 4
FREQUENCY OF REFERENCES TO OTHERS IN ALL MEMORIES BY RÔLE

Mothers	26
Fathers	14
Siblings	21
Other relatives	8
Other individuals	27
Total	95

TABLE 5
FREQUENCY OF MENTIONS OF TYPES OF ACTIVITY

Self		Others	
Muscular	86	Muscular	92
Non-muscular	43	Non-muscular	7
Total	129	Total	99

TABLE 6
FREQUENCY OF REFERENCES TO PARTS OF BODY
(17 Subjects)

Face and parts	9
Appendages	9
"Bottom"	1
Side	1
Freckles	1
Total	21

TABLE 7
FREQUENCY OF SUBJECTS SPECIFYING RECIPIENT OF INJURY*

Self	19
Blood Relatives	3
Animal	1
Total	23

*Sex incidence is roughly two boys to one girl.

TABLE 8
FREQUENCY OF SEVERITY OF INJURY

Severe	3
Moderately severe	7
Moderate	4
Mild	1
Unknown	8
Total	23

TABLE 9
FREQUENCY OF MENTIONS OF ILLNESS IN MEMORIES
(Six Subjects)*

Self	5
Father	1
Mother	1
Total	7**

*Recounted by five girls and one boy.

**Two were judged to be severe while the severity was unknown in five.

category that it was impossible to obtain any meaningful information out of a consideration of the data. This was especially true of such categories as inanimate objects where the responses included almost any object that could be observed in one's daily living. A number of categories revealed data that appeared, at first glance, to have some relevance. Thus 54 per cent of the clinic subjects and 29 per cent of the institutional group gave no response to others in the early childhood memory. However, analysis of the difference

between the two groups of subjects for both the variables self-reference and references to others yielded statistically insignificant results.

Out of the total group there were only nine references to physical destructiveness and only two to death (one father and one mother).

Six subjects mentioned animals, giving a total of seven references. None ascribed any personality characteristics to these animals and only one specified a reaction to it, namely that of fear.

Although the small frequencies preclude statistical confirmation of any hypotheses, it is interesting to note the greater frequency of mention of muscular activity as compared to non-muscular (seeing, reading, etc.) activity. These findings, however, are tempered by the fact that the term activity generally implies muscular involvement.

It is interesting to speculate, in light of the ratios of mentions of illness and injury according to sex, that aggressive and/or hostile fantasies seem to be more likely to be expressed in a passive manner (illness) by girls and a more active manner (injury) by boys.

Although a number of authors such as Friedman (+), Brodsky (2), Kahana, *et al.* (5), and Bach (1) have pointed out the significance of both manifest and latent content of the earliest memory for individual subjects, this study has shown very few characteristics that are common to a group of emotionally disturbed children.

Conceivably the heterogeneity of our group has obscured findings which might be significant for individuals differentiated in a way other than by the catch-all "emotionally disturbed." It might be more cogent, and more useful, to sub-divide the groups into more homogeneous units; e.g., dynamics of personality structure, clinical diagnosis, defenses, etc. Towards this end, the data were re-examined after the subjects were grouped according to clinical diagnosis and, secondly, major mode of reacting. In doing this, information on nine subjects was lost—their case records were not available at the time that the statistics were being compiled.

The diagnostic categories and the number of subjects in each group are as follows: schizophrenia, 16; neurotic character disorder (including primary behavior disorder and neurotic behavior disorder), 51; psychoneurosis (including psychosomatic conditions), 19; and prepsychotic condition, 4. In three of the four groups the children were about equally divided between the sexes as well as to place of abode (those living with *vs.* those living away from their parents). In the case of the neurotic group only three lived in the residential home while 15 lived in their own home. This difference very likely reflects the fact that the behavior of the majority of these children was

such that the drastic step of removal from the home was not felt to be warranted. The character disorder group had a preponderance of girls (30:21).

The average age for the psychoneurotic group was lower than the other three groups (9.3). The prepsychotic group had an average age of 11.7 while the average ages for the neurotic character disorder and schizophrenic groups was 12.8 and 13.3, respectively.

The same trends, or absence of trends, that were observed previously in the entire group, reappeared when the sample was broken down according to diagnostic category. Only some of the highlights will be presented at this time.

Rather striking was the consistency with which the memories were dated within the Oedipal years. Two of the four memories of the prepsychotic group were so placed. The per cent of memories dated within the years two through six for the other children were as follows: psychoneurotic, 61; character disorder, 76; and schizophrenia, 67.

The ratios of muscular activity to passive activity was repeated within all four groups with the exception of the character disorder group. In this latter case, 40 instances of other people being engaged in muscular activity were recorded with only one instance of a passive activity. Muscular activity ascribed to themselves appeared 38 times to 22 instances of non-muscular activity in this group. These people then are more prone to think of other individuals in vigorous terms than the members of the other three groups are.

As mentioned previously, the total sample was also subdivided on the basis of the major mode of reaction of the child. Accordingly, three arbitrary groups were set up in terms of the way the child handles his conflicts. The individual who consistently had difficulty with his environment (including his parents and parent-surrogates) was defined as an "acting-outer." The child who tended to be withdrawn and who internalized his problems was labeled "inhibitor." Those children who alternately rebelled against their environment and interiorized their conflicts were termed "vacillators."

The average ages of these groups were as follows: vacillators, 11.7; acting-outers, 13.3; and inhibitors, 11.02. The acting-outers had a preponderance of girls (22:12); the inhibitors were largely boys (18:10); while the vacillators were about equally divided (boys:girls :: 12:15).

In terms of the distribution of living at or away from home, the ratio was 20:8 for those children who directed their problems inwardly. The other two groups were about equally divided on this dimension. This finding undoubtedly results from the fact that the overwhelming majority

of the children placed in the institution are done so because of their acting-out proclivities.

Again, the dating of the memories cluster around the oedipal years: vacillators, 72 per cent; inhibitors, 75 per cent; and acting-outers, 83 per cent.

Contrary to expectations, those children who were described as externalizing their problems did not ascribe more activity to themselves or to others nor was the activity they described more likely to be muscular. The three groups did not differ from one another and mirrored the findings for the group as a whole.

D. DISCUSSION

In spite of the relatively negative results in all categories, it still might be suspected that, for example, such events as traumatic "home" situations (especially those so severe as to require removal of the child from it) might influence the incidence of responses in the manifest content. In this case the frequency of references to homes or locale would be involved. One could expect an increased frequency on the basis of a "wish fulfillment" fantasy or, on the other hand, a lessened frequency or inhibition of this type of response based on the need to deny the existence of the painful situation. Our data supported neither hypothesis. It suggested, rather, a third which will be discussed later. Although the house or home is important to the child in terms of offering what may be called security, there are many more important contributions to security in life. Home, in a physical sense probably achieves some of its greatest psychological importance when it does not exist. The child who loses his home repeatedly as the result of frequent family moves or for other reasons may develop pathological reactions to the frequent change. Another possibility is that he may use the repetitive loss of home as a readily available situation upon which to displace other, more painful, problems. These might be the parental abnormalities which lead to the frequent moves, the unconscious conflicts which lead to the neurotic behavior which in turn lead to the loss of home or other situations. It is well documented (3) that frequent changes in home location are a reflection of social and psychological problems.

Finally, and most important in answering the question of the negative significance of the data of the subjects studied in this presentation, is the fact, alluded to before, that the physical structure of the home or location is probably of much less importance than the events which transpire between significant persons, including the subject, in the particular location.

These three variables, the event, the other persons involved, and the sub-

ject could, then, be expected to show significant variations in different groups of subjects depending on their presence, absence, or the quality of reference. However, inspection of our data again leads to negative results. Neither the presence nor the nature of the activity reveal greatly pertinent differences between one group and another. One source of error could be due to inadequate grouping and this is especially true when this is done on the basis of clinical diagnosis, an aspect of psychiatry (especially child psychiatry) which leaves much to be desired. One can be somewhat more certain of his categories using the basis of mode of reaction (as used here) but even here the meaning of the activity to the individual is ignored. The hypothesis was offered that the group which responded to life situations by action would show an increased incidence of activity in their memories. Just the reverse was found to be true and it is equally possible to assume that those children who had such easy access to acting out of conflicts or as a defense against conflicts had a lesser need or value for fantasies or memories of activity. Those children who reacted with inhibitory symptoms, the psychoneurotic children or those with psychosomatic disorders, conceivably had less outlet for aggressive expression and more need to portray aggression in their fantasies such as the early memory.

Even if the above speculations are not valid, merely considering the presence or absence of a particular type of activity leaves much to be desired. Two or more acts, although apparently identical on the basis of manifest action, may have completely different latent meanings in different individuals or at different times in the same individual.

Similar comments could be applied to personal references which might be the expression of narcissism, of exhibitionism, a defense against castration anxiety, a displacement of attention from unacceptable externally directed impulses or even a condensation of a number of affect and/or object references. Similarly, references to others would only be important inasmuch as they relate to the individual, his situation, the state of his libidinal and ego development, the duration of the effect of the person in the particular reference mentioned, and numerous other qualifications.

Introduction of categorization by way of psychodynamics, though a further refinement in classification, probably would add little to information obtained by study of manifest content. It is almost too elementary to note that no individual has a single psychodynamic conflict or structure to his personality. Rather, there are numerous defenses, fixation points, modes of libidinal and aggressive discharge, sublimations, strengths, and weaknesses.⁴

⁴Previously mentioned studies have investigated the importance of these per-

Even if a clear-cut schematization on the basis of personality dynamics could be effected one would still have to deal with the objections previously raised to considering particular single items of the manifest content. One way that this could be dealt with would be to analyze the items of manifest content in terms of a single item's relation to one or more other variables. For example it would not be sufficient merely to consider the presence or absence of a mother or mother-surrogate in a memory. Rather, one would have to inspect the data for the presence of the mother in a specific kind of relationship, perhaps a giving relationship, and to this one might also have to add the recipient of her activity, the recipient's reactions, or other items before satisfactory correlations could be made. In order to make such an analysis meaningful it would require not hundreds of subjects but, rather, thousands even if it were only to include a small percentage of the possible variations in the manifest content.

For the above reasons as well as in light of the negative findings here obtained it appears that the most fruitful method of investigation of earliest childhood memories would be to determine the significance of the material to the subject rather than to try to analyze the more minute aspects of the manifest content out of context. It is possible that, in a very extensive study, certain constellations of items in the manifest content could be correlated with certain types of subjects but it is doubtful that such a study would contribute any more, if as much, as a smaller, thorough-going psychodynamic study.

E. SUMMARY

To supplement previous case history studies that utilized the earliest memory to draw inferences about an individual, an analysis of the manifest content of 104 such memories was undertaken. Our sample consisted of children who were emotionally disturbed as evidenced by their either being referred to a psychiatric clinic or their living in an institution as a result of being unable to make a satisfactory adjustment in an ordinary family unit.

Seventeen separate major variables were selected and the data were analyzed as to the presence and/or frequency of these items on the total sample as well as when the subjects were grouped on the basis of clinical diagnosis and categorized in terms of the child's manner of handling his conflicts. Although the only statistically significant findings were the frequency of the mention of geographic location and the dating of the memories as occurring

sonality factors, but in relation to the dynamic structure of the memory (2, 4, 5). It might be of further interest to evaluate the screening function of early memories in this context.

in the Oedipal years, other leads which warrant further investigation did appear.

The generally negative correlations were considered to be the result of certain limitations to this type of study and reasons to substantiate this hypothesis were offered. It was concluded that the most appropriate method to use in the study of such material was that of considering the significance of the material to the subject in terms of psychodynamics rather than to try to analyze the items of the manifest content out of context.

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LATENT CHANGES IN THE FOOD PREFERENCES OF IRRADIATED MONKEYS*¹

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A. INTRODUCTION

These experiments were suggested by Leary's (4) findings of changes in food preferences following whole-body irradiation with X-rays. These changes were restricted to a period of about four weeks following dosage and were dose independent. The present studies were designed to determine whether relatively permanent food preference changes occur, and to examine further the possible reasons for changes, if they do occur. The present studies differed from Leary's study in having more subjects in each group studied, and in having animals that had recovered from rapidly changing physiological concomitants of irradiation.

B. METHODS

1. *Subjects*

Forty-one male rhesus monkeys were used as Ss in the first of these investigations; 39 of the same animals were employed in the second study. All Ss had similar taming and training histories and had been used in an extended series of investigations (1, 5). The Ss were divided into three subgroups based upon dosage of ionizing radiation received. The original control subgroup consisting of 10 animals had not been irradiated; a low dose subgroup was comprised of 18 animals, each of which had been irradiated with doses in the range of 10 to 16 neutron rep plus 70 to 140 gamma roentgens; a high dose subgroup included 15 animals each previously irradiated with doses in the range of 27 to 54 neutron rep plus 284 to 557 gamma roentgens. Between the first and second experiments one animal in the control group and two animals in the high dose radiation group died of food poisoning.

Irradiation had been accomplished during a period ending 14 months before the start of the present investigations and had included both gamma and neutron emissions.

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2. *Procedure and Apparatus*

Two different methods were used to determine the preferences of monkeys for five selected laboratory foods: raisins, apple, bread, potato, and celery. Four of the foods were used in studies of food preferences of monkeys at Wisconsin (2, 3). The procedure used in the first determination allowed the animals to make free selection from ample quantities of the five foods while the second method required the animal to make a 5-choice ranking on each trial. Both methods were conducted in the *WGTA*.

3. *Free Choice Determination of Food Preference*

The apparatus used in this method consisted of a food-well board measuring 28 in. by 9 in., and containing 125 food wells. The wells were arranged in 5 rows and 25 columns, and were spaced $\frac{3}{8}$ in. apart (side-to-side) in the rows and 1 in. apart (front-to-back) in the columns. The food wells were color-coded with five different colors in order to rapidly guide the experimenter in placing the food. A drop of a particular color was placed in the bottom of one well in each column according to a table of random numbers. On a specific day of training, a given food was assigned at random to one of the five colors and was distributed according to that color code. The remaining four foods were assigned and placed in a similar manner.

A trial was run as follows: the food-well tray was loaded with 125 pieces of food in the manner described; the stimulus tray carrier was advanced to a forward position; the opaque screen of the *WGTA* was raised; and the animal was allowed to select food freely until he had taken 60 pieces of food. The experimenter then withdrew the stimulus tray carrier and identified and enumerated the missing pieces of food. Each animal was given four such trials (one trial every other day for eight days) and scores were based upon the number of pieces selected out of the total 100 available of each kind of food. If the animal did not complete selection of 60 pieces within three minutes the trial was terminated and the number and kind removed was recorded.

4. *Rank Order Determination of Food Preference*

This method was employed in part because it more closely approximated the rating scale methods used in determining food preferences of human subjects, and in part because the present experimenters feared that the animals could not reach the most distant parts of the free selection preference board. This method employed a food well tray containing only one row

of five food wells spaced $\frac{3}{8}$ in. apart side-to-side. The center food well was equidistant from the sides of the tray and 1.0 in. from the front edge.

The five foods were assigned to the five food wells at random on a particular trial and the trial was run in the same manner as described in a previous procedure. Twenty trials were given to each animal every day for four days. Animals were allowed to take each of the five pieces of food available on each trial. If all pieces of food were not selected by the end of 50 seconds, the trial was terminated and the preference order of the remaining foods recorded as a tie. The ranks assigned by the order of selection on each trial were summed over the 20 trials within each day and these values were analyzed.

C. RESULTS AND DISCUSSION

Figure 1 shows the animals' performance on the food preference task which required *Ss* to select 60 of the 125 pieces of food available, and Figure 2 illustrates *Ss* performance on the 5-choice task. The ordinate in the former figure is expressed as the percentage of available food that *Ss* selected and the ordinate in the latter figure is indicated as mean rank. A rank of 5 was assigned to the food selected first on a particular trial, 4 designated the food selected second, etc. Mean rank was computed by averaging the ranks assigned to a food on 20 trials.

The results of the two studies were first considered grossly by means of an analysis of variance. The scores used for analysis in the first experiment were relative rather than absolute because *Es* were not always able to terminate the trials at the moment *S* had selected exactly 60 pieces of food. The scores used in the second analysis were the sums of the rank order of preference of *Ss* for foods on 20 5-choice trials. The mean squares for the primary source of *food quality* and the interaction *food quality by treatment group* were obtained and *F*-ratios were computed by dividing these mean squares by the mean square for the interaction *food quality by Ss within treatment groups*. The primary effect and interaction were both significant at the 1.0 per cent confidence level or beyond when this analysis was applied to the data obtained by each of the methods. These data indicated that more detailed analysis should be made within each of these effects.

1. Food Quality

Harlow and Meyer (3) reported the results of presenting monkeys five laboratory foods: celery, bread, potato, raisins, and peanuts paired repeatedly two at a time in all combinations. The first four of these foods were em-

played in the present study, however apples were substituted for peanuts. The Wisconsin workers reported that laboratory "sophisticated" monkeys had different food preferences than "naïve" monkeys, and that seasonal changes occurred in the food preferences of the "sophisticated" Ss. The Ss in the present study had had considerable laboratory training prior to the present study and were regarded comparable to Harlow's sophisticated Ss. The period the present investigation was conducted, February-April, was

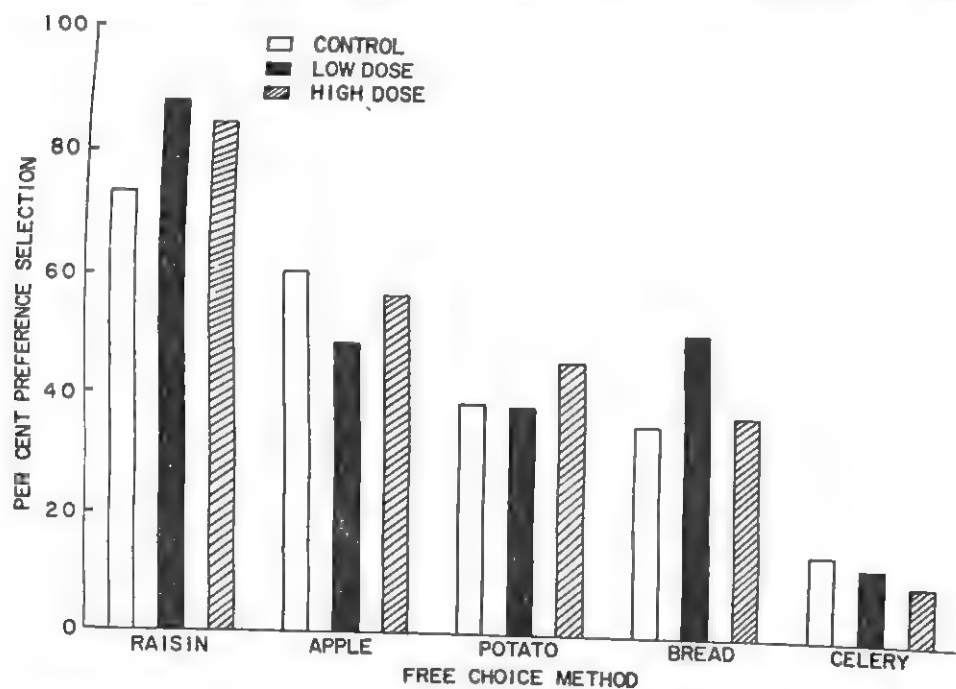


FIGURE 1

FOOD PREFERENCES OF NORMAL CONTROL AND IRRADIATED MONKEYS BY A FREE CHOICE METHOD

considered comparable in season to the later period in Harlow's study because of the earlier spring in Texas than Wisconsin. The results of the Texas study agree strikingly with the comparable results obtained by the Wisconsin workers. In both of the present experiments and in Harlow's investigation the order of preference of the four comparable foods was identical, i.e., from most to least preferred: raisin, potato, bread, and celery.

The " t " test for related samples was employed to test the significance of differences between Ss preferences for any two foods. Each of the 10 comparisons of Ss preferences in the experiment employing the 5-choice ranking method were significant at the 5.0 per cent confidence level or beyond.

One difference in preference, that between potato and bread, was not significant when Ss' preferences were determined by presenting 125 pieces of food at a time. This failure to find significant differences between bread

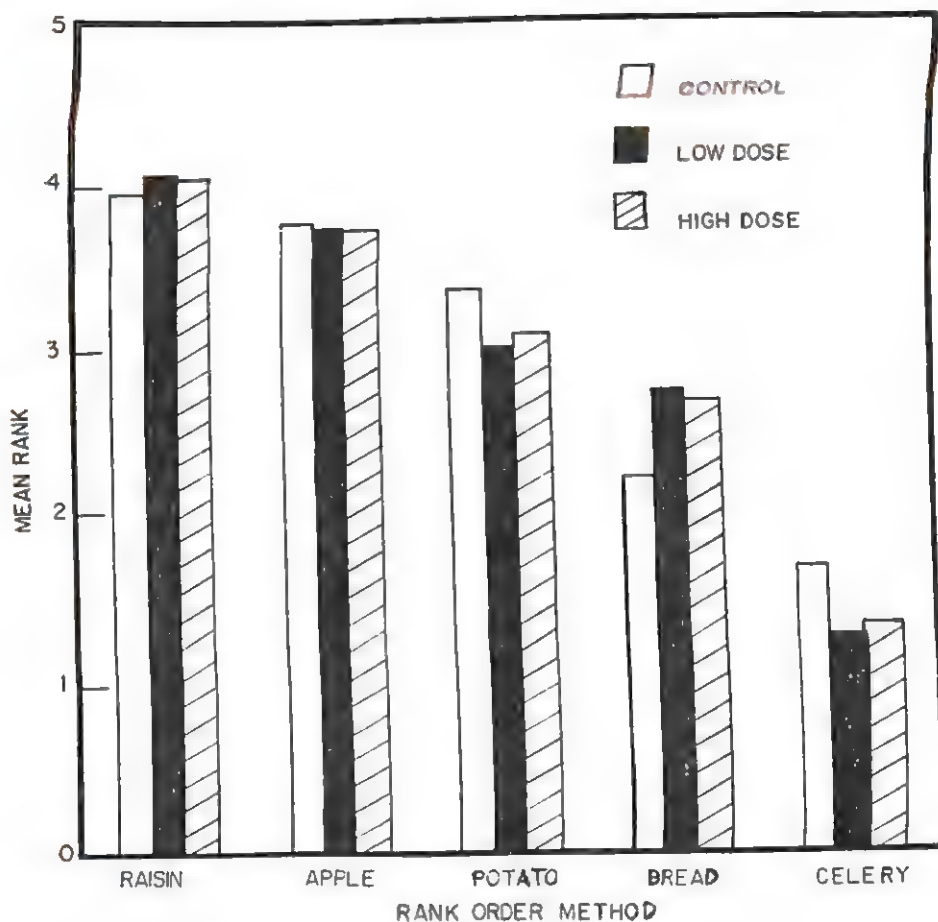


FIGURE 2
FOOD PREFERENCES OF NORMAL CONTROL AND IRRADIATED MONKEYS BY A RANK ORDER METHOD

and potato is consistent with the Wisconsin findings of small differences in the monkeys' preferences for bread and potato.

2. Relation between Radiation Treatment and Food Preference

The gross analysis of the data of both experiments, which was referred to above, indicated that the *treatment group by food quality* interaction is

significant. This finding is interpreted as meaning that subjects in the three groups differ in their food preference patterns. It does not signify significance of change in preference for a particular food, which results from irradiation. Ten analyses of variance were computed in order to determine specific differences in preferences for a particular food. Each analysis contrasted the performance of subjects in each of the groups for one particular kind of food.

Not one of the five analyses of data obtained by the 5-choice rank method was significant. Two of the analyses of data of the free choice experiment were significant, analysis of preferences for apple and for bread. If the reader refers again to Figure 1 he can see that in both cases the effects are complex. Subjects in the control group have a higher preference for apple than subjects in either irradiated group, but animals surviving low dose radiations prefer apples less than animals previously receiving high dose radiations. Animals in the low dose group show a very striking preference for bread, but monkeys in the control and high dose groups show a much lower preference. These findings indicate that the preferences of monkeys for foods are altered in a complex manner and that changes persist for a long time after the period of radiation. A simple caloric preference hypothesis, such as advanced by Leary (4), does not fit the results of the present studies, although it is possible that immediately following a period of anorexia the changes in food preferences could be related to inanition while at a later period the changes were appetitive. However, during anorexia all but the most highly preferred foods are rejected, and the imbalance in nutrition would probably affect mineral and vitamin needs more than simple caloric needs. Furthermore, appetites have been shown to be related to quality more than to caloric value of the food and appetites are related more to the needs of *Ss* for minerals than needs for carbohydrates, proteins, and fats (6). Therefore, the present investigator is inclined to reserve judgment on explanatory notions at the present stage of research, but feels that the gross damage to the gut following whole-body ionizing radiations might be related to the changes in food preferences of irradiated *Ss*.

D. SUMMARY AND CONCLUSIONS

The food preferences of male rhesus monkeys were studied by two methods: free-choice and rank order. The *Ss* constituted three groups, two groups had received mixed source whole-body radiations and one group consisted of nonirradiated *Ss*.

1. Food preferences were very similar to those reported by other workers.

2. Irradiated and nonirradiated Ss showed different patterns of food preferences and the differences were more apparent when the free choice method was employed. Subjects in the three groups differed significantly in their preferences for apples and bread when the free-choice method of determining preferences was employed.

3. The hypothesis of caloric hunger, which had been advanced by Leary to explain differences in food preferences of irradiated and nonirradiated Ss, was questioned.

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ROSENZWEIG PICTURE-FRUSTRATION STUDY RESULTS WITH MINORITY GROUP JUVENILE DELINQUENTS*

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A. PROBLEM

Recent work in psychology has been devoted to an appraisal and validation of the well-known frustration-aggression hypothesis, which claims generally that aggression follows some frustration (1). Rosenzweig and others have demonstrated the frustration-aggression patterns for a normative population (9). If, then, one accepts aggression as a dynamic result of interacting personality and environmental factors it becomes of some importance to investigate the possibility of definite, measurable, modes of response to frustration in a population of individuals who have shown overtly aggressive behavior such as anti-social conduct.

It is the major purpose of this study to compare the reactions to a frustrating situation of a group of adolescent male delinquents with a control group of non-delinquent males. The instrument of choice was the Rosenzweig Picture-Frustration Study, since it provides a means of classifying, both in terms of direction of aggression and types of reaction, modes of response to common frustration-inducing situations (10). Another purpose of this study is an attempt at direct validation of the *P-F* Study by determining whether or not aggression, as ascertained from actual behavioral observation and case records, is related to the various dimensions of the test. Finally, a third aim of this study is to compare *P-F* Study responses of two culturally disparate groups. To this end, our study group, comprised entirely of subjects of Spanish-American ancestry, was compared with Rosenzweig's normative group.

Related studies in the area of delinquency have been done by Gatling (4), Foulds (2), Fry (3), Holzberg and Hahn (5), and Vane (11). The first two investigators, however, did not actually use the *P-F* Study in their research. Foulds' work is not directly comparable here because it was concerned with a highly restricted group of mental defectives. Fry did use the *P-F* Study in research with adult, institutionalized criminals of both sexes; Holzberg and Hahn utilized it with institutionalized adolescent, male

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psychopaths; and Vane employed it with girls in a state reformatory. With the exception of the Holzberg and Hahn study, all the foregoing research indicates that the classificatory scheme proposed by Rosenzweig has possibilities in demonstrating recognizable patterns of response to frustration in delinquent and criminal populations. From the standpoint of racial and cultural factors, McCary (6, 7, 8) has used the *P-F* Study with Negro and white adolescents in both northern and southern communities, indicating that the *P-F* Study responses vary with cultural factors.

B. METHOD

A total of 64 subjects was used in this study, 20 delinquents from the Pre-Vocational School in Albuquerque, N. M., and 44 non-delinquents from the Santa Fe High School in Santa Fe, N. M. All subjects were non-institutionalized males of Spanish-American descent between the ages of 15 and 18. The mean age of the delinquent group was 15.6 years; of the non-delinquent group it was 16.2 years. The delinquent group had histories of persistent delinquency and had appeared before the juvenile court three or more times. At the time of the study, they were on probation to the principal of the Pre-Vocational School. The non-delinquent group had no member with a history of repeated delinquency. There was no attempt to match the groups precisely for intelligence, although it was felt that the high school group was the best one available as a control similar in background to the delinquents. It was necessary to confine the study to the cultural minority group of Spanish-Americans since, at the time of the study, the greatest number of delinquents in the Pre-Vocational School were members of this group. Hence, it was decided to restrict the members of the control group in terms of nationality descent to eliminate the possible effects of this variable.

Both high school and delinquent subjects were reassured about the purpose of the test, and in both groups the test was administered to small sections of from three to five subjects to assure maximal rapport. Because of the fact that bilingualism might affect the test, instructions were read aloud twice to all *S*'s. For the delinquent subjects an evaluation of overt aggressive behavior was made by their teacher-principal¹ who utilized personal classroom observations, an intimate knowledge of the boy and his family situation, and all known records of his delinquent behavior. Each subject was evaluated for degree of aggression by means of the paired-comparison method, so that in contrasting every boy with every other one it was possible to rank the

¹The authors wish to express their appreciation to Mr. Paul Gallegos for his invaluable aid in this connection.

20 subjects in order from the most to least aggressive. Independent ranking of the aggressiveness of each delinquent was also done by one of the authors (GJK) on the basis of case records only. The correlation between rank orders of the two judges was .66, which indicates a fair degree of reliability, attenuated undoubtedly by the different bases of judgment. For purposes of correlation with the *P-F* Study, the ratings of the teacher-principal were used because it was deemed that they were more valid.

C. RESULTS

Tables 1 and 2 present results of the *P-F* Study with both delinquent and control groups. Table 1 represents results using the major scoring

TABLE 1
COMPARISON OF DELINQUENTS AND NONDELINQUENTS FOR MAJOR *P-F* TEST CATEGORIES

Category	Nondelinquents		Delinquents		Difference	<i>t</i>
	Mean	σ	Mean	σ		
E%	40.0	15.83	37.4	15.20	2.6	0.61
I%	31.3	8.23	32.4	7.35	1.1	0.49
M%	28.7	9.70	30.2	10.79	1.5	0.56
OD%	18.4	7.21	18.8	7.70	0.4	0.18
ED%	53.2	13.58	55.1	10.55	1.9	0.55
NP%	28.4	11.27	26.1	7.88	2.3	0.81
GCR%	60.6	10.66	61.9	19.26	1.3	0.35

TABLE 2
COMPARISON OF DELINQUENTS AND NONDELINQUENTS FOR SUBSCORES ON *P-F* TEST

Factors	Nondelinquents		Delinquents		Difference	<i>t</i>
	Mean	σ	Mean	σ		
E'	1.68	1.22	1.30	0.94	0.38	1.18
E	6.70	3.60	6.45	3.34	0.25	0.26
e	1.23	2.91	1.22	0.78	0.01	0.00
I'	0.77	0.82	0.88	0.61	0.11	0.15
I	3.07	1.22	3.55	1.48	0.48	1.35
i	3.68	1.84	3.35	1.27	0.33	0.72
M'	1.97	1.25	2.33	1.18	0.36	1.07
M	2.98	1.51	3.22	1.98	0.24	0.54
m	1.92	1.26	1.70	1.43	0.22	0.61

categories of the test: Extrapunitive; Intropunitive and Impunitive for direction of aggression; Obstacle-Dominance; Ego-Defensiveness and Need-Persistence for the type of reaction. Table 2 gives results with the various subscore dimensions. In no case are there any statistically significant differences between the delinquents and nondelinquents.

Table 3 presents the Spearman rank-order *rhos* between the major cate-

gories of the *P-F* Study and the rankings of aggression made by the teacher-principal of the Pre-Vocational School for delinquents. In no instance do these correlations differ significantly from zero.

TABLE 3
CORRELATIONS BETWEEN RANKINGS FOR AGGRESSION AND *P-F* TEST (DELINQUENTS)

<i>P-F</i> categories	Rho
E	.014
I	— .020
M	.034
O-D	.129
E-D	— .165
N-P	.115

Because of the apparent statistical homogeneity of delinquents and controls on the *P-F* Test, both groups were combined into a larger single group with *N* of 64. Tables 4 and 5 present a comparison of the combined study group of Spanish-Americans with the Rosenzweig normative group. Table 4 presents comparisons of all major scoring categories, and indicates the combined study group to be lower than the Rosenzweig normative group in Extropunitive score at the 1 per cent level of confidence. The Spanish-American group is significantly higher than the normative group at the 1 per cent level of confidence in the Intropunitive dimension. *GCR* comparison indicates the study group is lower than the normative group at the 1 per cent level of confidence.

Table 5 compares the combined study group with the Rosenzweig normative group for all sub-score dimensions. Comparisons reveal that the combined study group mean is significantly lower than the Rosenzweig normative group in both *E'* and *e* at the 2 per cent level, and in *I'* at the 1 per cent level. In the *I* and *i* comparisons, however, the situation is reversed and the combined study group mean is higher than the Rosenzweig mean at the 1 per cent level. In the *M'* dimension the combined study group mean is also significantly higher than the Rosenzweig normative mean at the 1 per cent level of confidence.

The uniformly non-significant differences between the delinquent and control groups of the present study suggest that whatever factors are operative in delinquent behavior do not influence responses to the Rosenzweig *P-F* Study, at least for our sample. Perhaps the only other comparable studies are those of Fry (3), Holzberg and Hahn (5), and Vane (11). Fry contrasted a sample of prisoners with one of college students, including data on comparative median scores of three groups—the college students,

Rosenzweig's normative group, and the prisoners. Although it would appear that prisoners are much less extrapunitive and somewhat more obstacle-dominant and less ego-defensive than the normative group, Fry gives no significance tests between these groups.

TABLE 4
COMPARISON OF COMBINED STUDY GROUP WITH ROSENZWEIG NORMATIVE GROUP FOR ALL MAJOR CATEGORIES

Category	Rosenzweig group ($N = 236$)		Spanish-American group ($N = 64$)		Difference	t
	Mean	σ	Mean	σ		
E%	45.0	13.30	39.2	15.40	5.8	2.98**
I%	28.0	8.25	31.7	8.00	3.7	3.19**
M%	27.0	9.45	29.1	10.08	2.1	1.55
O-D%	20.0	7.80	18.5	7.38	1.5	1.38
E-D%	53.0	11.30	53.8	12.90	0.8	0.49
N-P%	27.0	10.30	27.7	10.60	0.7	0.51
GCR%	68.0	11.10	61.0	14.00	7.0	4.21**

**Significant at the 1 per cent level.

TABLE 5
COMPARISON OF COMBINED STUDY GROUP WITH ROSENZWEIG NORMATIVE GROUP FOR SUBSCORE CATEGORIES

Category	Rosenzweig group ($N = 236$)		Spanish-American group ($N = 64$)		Difference	t
	Mean	σ	Mean	σ		
E'	2.00	1.39	1.56	1.16	0.44	2.56*
E	6.60	2.98	6.62	3.53	0.02	0.04
e	2.00	1.29	1.23	2.45	0.77	2.40*
I'	1.30	0.97	0.80	0.77	0.50	4.30**
I	2.60	1.37	3.22	1.33	0.62	3.26**
i	2.60	1.45	3.58	1.68	0.98	4.22**
M'	1.40	1.06	2.08	1.24	0.68	3.97**
M	3.20	1.65	3.06	1.67	0.14	0.59
m	1.80	1.25	1.85	1.32	0.05	0.27

*Significant at 2 per cent level.

**Significant at 1 per cent level.

The insignificant correlations between overt, observable, aggressive behavior and the *P-F* Study in our work indicates that the latter is not particularly sensitive to this behavior. Our findings are essentially in accord with those of Holzberg and Hahn (5) who concluded that the *P-F* Study is incapable of discriminating between socially aggressive psychopaths and non-aggressive normal individuals.

Our results do not confirm those of Gatling (4) who postulated and found that delinquents should be more extrapunitive than a control group. His hypothesis was that the former would externalize blame more than

the latter. However, although he used Rosenzweig's *rationale* in categorizing behavior concerning the direction of aggression, he did not use the *P-F* Study *per se*, but a set of puzzles. He classified subjects' opinions on the solvability of the puzzles into one of the three dimensions of extra-, intro-, or impunitiveness and obtained significant results showing delinquents more extrapunitive, controls more intropunitive. Gatling's segmental situational approach differs from our more global evaluations of aggression, and certainly his testing procedure was not the *P-F* Study itself, so the two studies are not directly comparable. Gatling's results, as a matter of fact, especially regarding direction of aggression, would appear to be opposite from those of Fry (3), who found prisoners to be *less* extrapunitive and *more* intropunitive than either college students or Rosenzweig's normative group, significantly so in the case of the former comparison. Vane (11) reports significant differences between girl delinquents and nondelinquents several years older than our subjects, on the average. Delinquents had, briefly, lower scores in E, and higher scores in I, and M; lower scores in OD but higher ones in NP. These differences are, she contends, of the same manner and degree as those Fry found with his female prisoners. But she is surprised that her delinquent population indicates less aggressiveness (extrapunitiveness?) than either nondelinquents or the normative group. She feels that the particular response pattern she obtained was due to the fact that the delinquents were trying to make a favorable impression. We do agree with her general conclusion that it would appear to be inadvisable to employ the *P-F* Test to analyze delinquent reaction patterns.

The present study indicates significant difference in *P-F* Study response patterns between the study group and Rosenzweig's normative group. Any serious attempt to interpret these findings is precluded by limitations in the research design which was primarily concerned with the relationship between overt aggressive behavior and *P-F* Study scoring dimensions. Our findings do, however, suggest the feasibility of a future normative study with an indigenous Spanish-American population. McCary (8), too, found differences in both direction of aggression and type of reaction to frustration, according to Rosenzweig *P-F* Study response, based on geographic, sexual, and ethnic groupings. It would appear that there are no uniform "minority group" patterns on the test, since McCary (6) reports that whites are more passive than Negroes on the test, the over-all tendency being that the Negro was more overtly aggressive, whereas our Spanish-American group was significantly less extrapunitive and more intropunitive. On the basis of our findings, we must concur with McNary's suggestion that separate normative data should be developed for various geographical and ethnic groups.

D. SUMMARY

Contrast was made on the Rosenzweig Picture-Frustration Study between 20 juvenile delinquents and 44 controls, all Spanish-American males ranging in CA from 15 to 18 and members of the same minority group. Correlations were also determined for relationship between amount of overt aggression as ascertained from ratings of behavior by a competent judge and the test. Results reveal neither significant differences between delinquents and nondelinquents nor significant correlations between rankings of aggressive behavior and the test. However, comparison of the study group with Rosenzweig's normative group revealed considerable difference in *P-F* Study response patterns. This variation in *P-F* Study response would seem to be in part culturally determined and further normative study appears warranted.

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PARENTS' ATTITUDES AND ADJUSTMENT OF CHILDREN*

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A. INTRODUCTION

That there is a relationship between parental attitudes toward children and the personal and social development of children is one of the basic tenets in the fields of child development and parent education. Numerous studies have demonstrated the relationship between family relationship variables or parental attitudes toward children and various personal and social adjustment characteristics of the children.² In most of these studies, clinical judgment has been used or statistical tests have been limited to comparisons among mean scores or chi square analysis. The appropriate analysis of the relationship between parental attitude scores and children's adjustment scores is correlation, or ideally, regression analysis. In research previously reported (1), an attempt was made to determine the relationship between fathers' and mothers' parental acceptance scores (Porter, 7) and their children's personality adjustment scores (Rogers, 8). In that investigation, virtually no relationship was found for the various relationships which were tested. This raised the question whether the lack of association among the variables was due to inadequate measurement or whether the nonsignificant correlations were to be interpreted as valid estimates of the relationship. In view of the accumulated findings from other studies, adoption of the latter position appeared exceedingly rash and therefore additional research was undertaken to retest the relationship previously referred to as well as to test several other parent-child relationships.

The general hypothesis of the present study is that there is a positive relationship between parental attitudes toward children and the personal and social adjustment of the children. For research purposes, particular parental

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²Hurlock (5) supplies a very comprehensive bibliography of studies relating to research in child development, see pages 577-661. Many studies relating to the influence of family relationships and parental attitudes on the personal and social development of children are also reviewed and the findings discussed by Hurlock in Chapter 14, *Family Relationships*, pages 480-530.

attitudes and particular adjustment characteristics of the children must be specified and measured in order to test the veracity of the general hypothesis. The particular parental and child variables selected for the purpose of this investigation are described in the following section.

B. MEASURING INSTRUMENTS

The Porter parental acceptance scale and the Rogers test of personality adjustment were included among the measures used in the present investigation in order to retest the correlation coefficients previously reported (1). Definitions of scale components and reliability and validity data for the Porter and Rogers scales are available in the original reports of the instruments, Porter (7) and Rogers (8), and in the report of the previous study in which the two scales were used, Burchinal (1). No further test of the validity or reliability of the Rogers test was made in this study. Validity estimates furnished by Porter (7) and the internal consistency item analysis reported previously (1) were accepted as validity evidence for the acceptance scale. In the present study, raised split-half reliability coefficients were .79 for the fathers ($N = 49$) and .78 for the mothers ($N = 50$) who completed the acceptance scale.

In addition to the acceptance scale, the parents completed the University of Southern California parent-attitude survey (9). No further effort was made to establish the validity of this scale; the several efforts made by Shoben in this regard were accepted for the purposes of this study. Reliability coefficients, calculated by the split-half method and raised by the Spearman-Brown formula, were determined for the subscores and total scores for fathers and mothers. These are shown in Table 1 along with Shoben's reliability data.

In the present study none of the reliability coefficients for either set of parents ($N = 50$) or for the total sample of parents ($N = 100$) were close

TABLE 1
RELIABILITY COEFFICIENTS FOR THE SHOBN PARENT ATTITUDE SURVEY SCORES
(Raised by Spearman-Brown)

Shoben scores	Pairs of items	Shoben's study $N = 100$	Fathers $N = 50$	Present study	
				Mothers $N = 50$	Both parents $N = 100$
Total score *	42*	.95	.86	.80	.82
Dominant	19	.91	.69	.76	.71
Possessive	11	.90	.59	.28	.45
Ignoring	7	.84	.55	.41	.50

*Includes five pairs of items not included in any of the subscores.

to Shoben's results. In fact, the subscore reliability coefficients for the total sample parents, .50, .45, and .71, were too low to warrant use of the subscores. The reliability for the total scores, .82 for the 100 parents, .86 for the 50 fathers, and .80 for the 50 mothers, while high enough to warrant use were still considerably lower than the .95 reported by Shoben for the 100 mothers he tested.

The children also completed the California Test of Personality, Elementary, AA, 1953 revision. All of the children tested were in the fifth grade. Reliability and validity data reported in the California Test of Personality manual (10, pp. 4-10) were accepted for the purposes of the present investigation.

C. SAMPLE AND METHODOLOGY

Since the focus of the investigation was on parent-child relationships, locating the parents by means of the children appeared to be the simplest procedure to follow because the children are easily accessible through schools. In order to replicate certain features of the previous investigation of the relationship between parental acceptance and the adjustment of children, fifth grade children and their parents were chosen as the study population. Four classes of fifth grade children taken from three schools located in Marshalltown, Iowa, were selected. In each of the classes, all the children completed the Rogers and the California tests of personality and a short information blank. The information blank contained questions which were used to determine whether or not the child's family was eligible for inclusion in the study sample. Eligible children, and hence families, were ones in which both parents were living together with the child and ones which included at least two children. In addition, the teachers were asked to remove the blanks for any children who they thought did not have sufficient reading ability to answer the test questions with reasonable accuracy. There were 130 children in the four sections, but application of these criteria reduced the number to 60 children. Home contacts were made with the parents of these children and completed Porter and Shoben scales were obtained from 50 of the parents. One child did not complete the Rogers test and one father did not finish the Porter scale; hence, less than 50 cases were used for correlations based on these scales.

The field work was conducted during the month of March, 1956.

Among the 50 children whose personality adjustment scores were used, there were 31 girls and 19 boys. Some of the more pertinent characteristics of the sample of parents are reviewed below. Edwards' classification (2)

was used chiefly to classify the occupations but for borderline cases, the North-Hatt scale was employed as a guide (6). Approximately 18 per cent of the fathers were placed in the professional, the business, and managerial category; 22 per cent were judged to be trained white-collar workers or skilled workmen; 30 per cent were engaged in clerical, sales, or semiskilled jobs; 10 per cent were farmers; and 20 per cent were unskilled workmen. The mean age of the fathers was 42.5 years while that of the mothers was 39.4 years of age. The mean length of time the parents had been married was 18.1 years. Twenty-eight per cent of the fathers and 12 per cent of the mothers had not graduated from high school; 40 per cent of the fathers and 60 per cent of the mothers were high school graduates; 14 per cent of the fathers and 16 per cent of the mothers had some college training while 12 per cent of each group were college graduates; and 6 per cent of the fathers and none of the mothers had some postgraduate training. The mean educational level of the fathers was 12.3 years; for the mothers it was 12.5 years. On the average, the families included 3.2 children; the mode was three children per family.

D. ANALYSIS OF THE DATA

Scores derived from the four instruments used in this investigation permitted testing six relationships. Four of the relationships involved the association of parents' and children's scores while the other two relationships were comparisons of parents' scores on the Shoben and Porter scales and comparisons of children's scores of the Rogers and California tests of personality. The relationships between the parents' set of scores and between the children's sets of scores are presented first.

Coefficients for the relationships between the fathers' Porter and Shoben scores and the mothers' Porter and Shoben scores were determined for only the total scores for each scale. For the fathers' set of scores the coefficient was $r = -.32$ ($N = 49$, $P < .05$) while for the mothers' set of scores the correlation coefficient was $r = -.24$ ($N = 50$, $P > .05$). High scores on the parental acceptance scale are indicative of greater acceptance of the children. Total scores on the Shoben scale might be interpreted as an index of the degree to which a parent gives psychologically "healthy" or "unhealthy" responses over a heterogeneous series of items relating to parental attitudes toward children. High scores of this scale are regarded as indicative of "unhealthy" responses on the part of the parent. Because of the inverse weighting employed on the Porter and Shoben scales, the negative correlations are in the expected direction although they were low and in

one case the coefficient was not significantly different from zero. Hence, it appears that these instruments measure independent parental attitudes. This raises certain questions relative to the validity of the questionnaires which must be beyond the scope of this paper.

The correlations for the relationships between the Rogers and California subscores and total scores are shown in Table 2.

TABLE 2
SUBSCORE AND TOTAL SCORE CORRELATION COEFFICIENTS FOR THE CALIFORNIA AND ROGERS TESTS OF PERSONALITY ADJUSTMENT
($N = 76$)

California scores	Personal inferiority	Rogers scores		Day dreaming	Total score
		Social mal-adjustment	Family relationships		
Personal	— .33*	.04	— .33	— .24	
Social	— .25	.09	— .32	— .18	
Total score					— .34

*At $df = 74$, $P .05 = .23$, $P .01 = .29$.

The 50 children included in the sample plus an additional 26 children who failed to meet one or more of the family criteria for inclusion in the sample were combined for the analysis reported in Table 2. The relationships of interest here were those between scores on each test assumed to measure similar adjustment characteristics, namely personal and social adjustment and whatever is indicated by the total adjustment scores. The associations for the personal adjustment and total adjustment scores for each test, $r = -.33$ and $r = -.34$ respectively, were significant ($P < .01$). The relationship between the two test estimates of the children's social adjustment ($r = -.25$) was not significantly different from zero. It is interesting to note that the family relationships scores from the Rogers test showed similar degrees of association with the California personal and social adjustment scores. These correlations were also similar in magnitude to those found for the association of personal and total adjustment scores of the two tests.

Coefficients for the acceptance-adjustment relationship as tested by the parental acceptance and children's Rogers personality adjustment scores are shown in Table 3.

None of the coefficients listed in Table 3 were significantly different from zero. In a previous study (1), the same relationships were tested for 256 fathers and mothers and their children and only two of the 10 coefficients were found to be significant. These coefficients, $r = -.13$ and $r = -.12$, were considerably lower than several of the coefficients found in the present

study, but they were based on a larger number of cases. Thus, it appears that, as measured with the Porter parental acceptance scale and the Rogers test of personality, there is no measurable parent-child relationship. It is recognized that the Rogers test is rather old and some questions may be raised regarding its use. Therefore, a check on the acceptance-adjustment relationship as measured with the Porter and Rogers scales was planned as part of this investigation. The correlation coefficients for the parental acceptance and children's adjustment scores as measured by the California test of personality provide this check and are shown in Table 4.

TABLE 3
CORRELATION COEFFICIENTS FOR THE PARENTAL ACCEPTANCE AND ROGERS PERSONALITY ADJUSTMENT SCORES

Parental acceptance	N	Rogers scores				Total score
		Personal inferiority	Social maladjustment	Family relationships	Day dreaming	
Fathers	48	.13*	— .23	.01	.01	— .03
Mothers	49	.04	— .16	— .14	— .13	— .18

*At $df = 47$, $P .05 = .28$.

TABLE 4
CORRELATION COEFFICIENTS FOR THE PARENTAL ACCEPTANCE AND CALIFORNIA TEST OF PERSONALITY SCORES

Parental acceptance	N	California scores		
		Personal	Social	Total scores
Fathers	49	.07*	.09	.09
Mothers	50	— .02	.05	.01

*At $df = 48$, $P .05 = .28$.

All of the correlation coefficients in Table 4 were nonsignificant. These results add greater confidence to the conclusion that in terms of the tests used no measurable relationship exists between parental acceptance and the adjustment of children.

While no relationship was found between one parental variable, parental acceptance and several measures of children's adjustment characteristics, it was possible that some relationship existed between some other measure of parental attitudes and the measured adjustment characteristics of children. Data derived from the Shoben survey of parental attitudes was correlated with each of the children's personality tests to provide a possible answer to this suggestion. The relationships between the Shoben total scores and the children's Rogers scores are listed in Table 5.

Two of the relationships given in Table 5 may be taken as significant at the five per cent level. Both of these occurred for the association between the children's family relationship scores and their fathers' and mothers' total parental attitude scores, but the direction of the relationships was opposite from what might have been expected. High scores of the Shoben parental attitude survey indicate "unhealthy" psychological responses; high scores on the Rogers personality test indicate maladjustive characteristics. Therefore, the coefficients should have been positive as, for instance, were the two for

TABLE 5
CORRELATION COEFFICIENTS FOR SHOBN TOTAL SCORES AND THE ROGERS PERSONALITY ADJUSTMENT SCORES

Shoben scores	N	Rogers scores				Total scores
		Personal inferiority	Social maladjustment	Family relationships	Day dreaming	
Fathers	49	.20	.08	— .28*	.17	.07
Mothers	50	.18	.08	— .37*	.06	— .02

*At $df = 48$, $P .05 = .28$, $P .01 = .36$.

the children's personality inferiority scores and their parents' attitude scores. No major point of interpretation is undertaken here to "account" for these unexpected findings. At face value, the coefficients seem to imply that poorer family relationships are reported by those children whose parents expressed "healthy" attitudes toward them. When the reliability and the validity data for these instruments are considered in relation to the relatively low order of the coefficients, caution must be exercised before accepting the coefficients. Except for the two relations just discussed, there were no significant relationships between the children's Rogers subscores and total scores with the parents' Shoben total scores. These findings agree with those found for the acceptance-adjustment correlation analyses.

One more test of the parent-child relation was made. The correlation coefficients for the relationships between the parents' attitudes scores and the children's California adjustment scores are given in Table 6.

TABLE 6
CORRELATION COEFFICIENTS FOR SHOBN TOTAL SCORES AND THE CALIFORNIA PERSONALITY ADJUSTMENT SCORES

Shoben scores	N	California scores		
		Personal	Social	Total scores
Fathers	50	— .07*	— .09	— .08
Mothers	50	— .04	— .06	— .04

*At $df = 48$, $P .05 = .28$.

All of the coefficients listed in Table 6 were quite low and nonsignificant. There were no measurable relationships between the parents' attitudes toward children and the children's adjustment characteristics as measured by the California test of personality.

E. DISCUSSION

Of the 32 correlations which were calculated for the relationship between parents' and children's scores, only two were significant and these were opposite in direction from what had been expected. Therefore, on the basis of the instruments used, there was virtually no measurable relationship between the adjustment characteristics of the children and child training and care attitudes held by their parents. The general hypothesis of this study was rejected as untenable.

The uniformly non-significant nature of the findings of this investigation again raised the question whether or not the lack of association between the parents' scores and the children's scores was due to inadequate measurement or whether the lack of relationship was a valid inference for the description of the parent-child relationships. The present study provides more data than a previous one (1) as a basis for examining this question. Instead of having just one parent and one child measure, data are available for two parent scores each taken with two children scores.

Although more data are available relative to parent attitudes and adjustment of children, one might ask what is the quality of the data? The same general kinds of tests were used to measure both the parental attitudes and the children's adjustment characteristics. These were self-administered paper and pencil tests which contained all the inherent limitations of tests of their sort. Use of these tests can be defended only on the basis that for this type of investigation these are the only types of instruments available. Certain questions of the validity of these tests have not been fully answered. Indeed, some persons question their utility at all (3, 4). Furthermore, the limitations of each of the tests considered separately are confounded and greatly increased when any of the tests are taken in relationship to each other as was done in the correlation analysis reported in this paper. If generally held assumptions concerning the influence of parent-child relationships on the child's personality development are adhered to, the present data suggest that measurable parent-child relationships will not be found by using this type of instrument.

In addition to these methodological considerations, several points of a theoretical nature should be examined. First, one might question whether

the test estimates of the parental attitudes or children's adjustment characteristics were "unbiased estimates" of the parents' orientation toward their children or of the children's level of personality adjustment. Put another way, were the particular characteristics measured the crucial parent-child interaction or interrelationship variables? By crucial interaction, reference is made to parent and child interaction systems which appear to be of particular importance for the child's personal or social development.

This point can also be examined in a different light. If a phenomenological position is adopted in regard to the findings of this study, then it could be argued that the present research endeavor failed to come to grips with the problem under consideration. What is important for the personality development of the child is not necessarily what his parents report as their attitudes toward him, but what the child perceives as his parents' attitudes and behaviors toward him. It would be necessary if this point of view was adopted, to determine whether the child perceives himself as being accepted, dominated, protected by the possessiveness of his parents, or ignored by his parents, and then to correlate or compare these scores or responses from the child with other measures of the child's personal and social development. Acceptance of this premise does not invalidate many of the commonly held assumptions of parent-child interrelationships, but it does suggest the methodology of future research on this problem.

It appears that the only reasonable conclusion for this investigation is that, due to the limitations of the instruments taken singly or jointly, the failure to measure the crucial variable in the family situation, or the failure to obtain the child's perception of his parents' attitudes toward him, the psychological relationships which are strongly assumed to exist between parents' attitudes and behaviors toward children and their consequent influence upon the children's personality development were not adequately measured. The failure to obtain significant relationships among the variables studied raises serious questions concerning further investigations of this problem with instruments of the kind used in this study.

F. SUMMARY

The general hypothesis which the data reported in this paper were designed to test was: there is a positive relationship between certain parental attitudes toward children and the personality adjustment characteristics of the children. Estimates of the parents' attitudes toward their children were obtained from scores derived from the Porter parental acceptance scale (7) and the Shoben parental attitude survey (9). The California test of per-

sonality, elementary series, 1953 revision (10), and the Rogers test of personality adjustment (8) were used to estimate personality adjustment characteristics of the children. *Correlation coefficients were based on a sample of 50 fifth grade children and their parents taken from a city in central Iowa.*

Relationships between the two parent scales and the two children tests were first investigated. For the mothers, there was no significant relationship between their parental acceptance and parental attitudes survey scores. The same relationship for the fathers yielded a significant correlation, $r = -.32$, $P < .05$. The negative sign indicated that the association was in the expected direction. Each of the children's tests have subscores designed to yield estimates of the children's personal and social adjustment and each gives a total adjustment score. The association between the two sets of personal adjustment scores was significant, $r = -.33$, $P < .01$. The relationship between the two sets of social adjustment scores was not significant, $r = -.09$, but total scores also showed a significant relationship, $r = -.34$, $P < .01$. The negative signs indicate that the associations between the scores were in the expected direction.

When the fathers' and mothers' parental acceptance scores were correlated with the children's four subscores and total scores on the Rogers test and the children's two subscores and total scores on the California test, all of the 16 correlation coefficients were nonsignificant. When the same relationships were determined for the children's adjustments scores and the parents' total scores on the Shoben parental attitude survey, 14 of the correlation coefficients were nonsignificant and two, opposite in direction from what had been expected, were significant at the five and one per cent levels.

On the basis of the analysis of data gathered in this investigation, the general hypothesis was invalid. There was virtually no measurable relationship between the parental attitudes which were estimated by the Porter and Shoben scales and the estimates of the personality adjustment characteristics of the children as indicated by scores derived from the Rogers and California tests of personality.

In light of the generally accepted theories of the influence of parental attitudes and behavior on the child's personality development, several factors which might have contributed to the lack of association were discussed.

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MARGINAL SOCIAL VALUES OF RURAL SCHOOL CHILDREN*

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A. INTRODUCTION

This investigation was designed to explore the developmental nature and content of *marginal social values* of rural school children over a wide age range. The concept, *marginal social values*, is employed here to include those social incentives which involve positive valences in combination with some negative personal or social threat. By definition in this study these social values are marginal because they imply ambivalence and conflict about the personal and social acceptability of actions related to goal achievement. Often such values are recognizable and identifiable in a particular subculture while obviously incompatible with more formal personal and social behavior standards implicit in broader cultural norms. Dukes (2) has pointed out the need for research programs in psychology designed to examine the circumstances of subgroup culture conflicts.

Dares of school children frequently possess the characteristics of these conflicting elements and also have strong social motivational properties. Although informal in nature and frequently in conflict with authority and with broader social values, dares constitute potent and pervasive influences upon behavior among school children and possibly among adults. For these reasons marginal social values were explored in this investigation by means of an open-end questionnaire concerning children's dares.

It was hypothesized that the content of children's dares would provide clues to theoretical and practical motivational problems. An intriguing theoretical puzzle for psychologists is the tendency of people to seek out or "play with" danger. Such a tendency is not entirely consistent with prevalent theories of homeostasis or reinforcement. An active challenge to danger is implicit in the dare situation. The strength of the drives for status and unusual social variations for the expression of these drives in our culture are reflected in this marginal behavior pattern. It was further hypothesized that some of the dares might represent mechanisms by which repressed aggressions may be impulsively expressed in reality. In fact, dares

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may be viewed as rationalizations with some degree of social acceptability insofar as the individual gains some marginal social value from challenging authority or danger.

From a practical point of view it was hypothesized that the content of responses to the dare questionnaire would provide developmental generalizations concerning problems of children and adolescents involving very strong motivation so repressed as to require this type of marginally acceptable outlet. Extreme examples of such behavior are found in recent newspaper accounts of accidents resulting from dares. Two children were drowned in a small Connecticut town as a result of a dare to skate on thin ice. One adolescent was killed and five others were hospitalized in Pennsylvania in an automobile "dare race." At the adult level are the many examples of jumping from the Brooklyn Bridge in response to dares. Such newspaper accounts are frequently encountered and are perhaps dramatic examples of the social causes of preventable accidents in childhood and adolescence. Accidents represent a major cause of death in adolescence, and there is reason to believe that many of these accidents are psychologically generated (1).

In summary, the major purposes of this study were to explore by means of an open-end questionnaire administered over a wide age range of children and adolescents: (a) the concept of *marginal social values* as defined by children's dares and (b) the developmental content of children's dares as clues to important informal motivational values.

B. METHOD

1. *Population*

The original sample included 1,022 rural school children from which 720 cases were selected for analysis in this investigation. This selection was based upon a modification of Kelley's modal age-grade sampling scheme (3) for minimizing serious overlap in mental traits when studying developmental trends. According to Kelley's approach only those cases which represent the modal age for a particular grade would be included. This criterion was modified to include the modal age *plus or minus one year* for each grade level in the present study.

The subjects in this sample attended 13 schools in 11 predominantly rural communities in eastern Connecticut. Participating schools were in communities where for each: (a) the principal method of mail distribution was by means of rural mail carrier, (b) agriculture was listed as the principal industry, and (c) with one exception, the population numbered less than 5,000. For these reasons it appeared that the population investigated was

essentially rural. The population of 720 rural school children consisted of 40 boys and 40 girls from each of Grades 4 to 12. The age, grade, and sex distributions of this rural sample is shown in Table 1.

TABLE 1
AGE, GRADE, AND SEX DISTRIBUTION OF RURAL SCHOOL SUBJECTS
($N = 720$: 40 boys and 40 girls in each grade)

Grade	Age range	Average age	
		Boys	Girls
4	8-10	9.0	9.1
5	9-11	10.2	9.9
6	10-12	11.3	11.7
7	11-13	12.3	12.0
8	12-14	13.2	13.1
9	13-15	14.4	14.1
10	14-16	15.4	15.2
11	15-17	16.3	16.0
12	16-18	17.1	17.0

2. *Experimental Procedure*

Coöperating teachers who had previously been personally contacted and instructed by the junior author administered most of the mimeographed questionnaires to the subjects; the junior author administered a substantial proportion. In a preliminary tryout, he tested a lower elementary school population in order to determine the limiting factors for securing written responses from the open-end instrument. On the basis of his experience in this attempt and also on the basis of the quality of the communication in the responses obtained from the preliminary tryout, it was decided that Grade 4 was the lowest limit for securing intelligible, meaningful responses on this paper-pencil instrument. From these and other experimental tryouts, it was also determined that five minutes was adequate time for securing significant responses for each of the two questions employed. In the administration of the open-end questionnaire the following directions were read by the teachers to the pupils:

Some research workers at the University of Connecticut are interested in finding out more about certain things boys and girls of your age do. They need your help in finding out about these activities. You will be asked some questions on the sheets which have been passed out. Write as *much* as you know about each question. The more different things you write the more it will help the people who are making this study. No one, except those research workers, will see your papers—not even your teachers.

This is not a test, so your papers will *not* be marked or graded in any way. You are only asked to supply some information in which

those people are interested. Work *rapidly* and write as plainly as you can, but *don't* worry about spelling. Just spell the hard words any way you think is right.

You will be given *five (5) minutes* for the first question, and then your teacher will say, "*Time! Go on to the second question.*" After you have answered Question 2, your teacher will say, "*Time! Please hand in your papers.*"

Now fill in the headings at the top of the sheet. *Please wait for my signal before you begin.* (Pause until children fill in headings. Give help where necessary.)

Remember! You are being asked to help out some research workers at the University of Connecticut by giving as much information as you can in answering these questions. You may answer in short sentences or groups of words if you like. The papers will *not* be marked or graded in any way. Work *quickly* and answer *both* questions as well as you can. Any questions?

You all know what a dare is. You have all heard someone say, "I dare you." Now answer question No. 1. (Teacher reads aloud):

1. What dares are boys (girls) your age *asked* to take?

(At the end of five minutes, say, "Time! Answer No. 2.") (Teacher reads aloud):

2. What dares have you *taken*?

(At the end of five minutes the papers are collected.)

Separate forms of the mimeographed questionnaire were administered to the sexes. In each of the two forms the first question was phrased so as to refer to the sex of the subject taking the questionnaire:

What dares are boys your age *asked* to take?

What dares are girls your age *asked* to take?

Otherwise, the mimeographed questionnaires were exactly the same, consisting of the two questions read aloud by the teachers in the directions above.

C. RESULTS

The 5,175 responses obtained from the two questions were analyzed into 11 categories and subcategories of marginally acceptable behavior and one category of socially acceptable conventional behavior. Each category was functionally defined by verbatim pupil responses. The final categories with the operationally definitive pupil examples were the bases for the major analyses to follow, and are listed below:

Dare Categories and Operational Examples

1. *Attempt conventional and constructive praiseworthy feats.* Milk a cow. Do arithmetic. Clean chickens. Go to school and learn to work.

Bake a cake. Earn \$10.00. Play ball. Write a story 10 pages long. Try to swim. Play the piano. Get all A's on report card. Do spelling in three minutes. Run a movie projector. Collect papers for a paper drive. Sing a song (solo). Carry two pails of water at once to chickens. Enter a milking contest. Take care of small children. Go to parties. Try to pronounce a hard word. See who can do most farm work.

2. *Challenge or flaunt authority of:*

(a). *Parents or other adult authority in the home.* Stay away from home one night. Stay out late at night. Let air out of father's jeep tires. Go somewhere without parents' permission. Go out without parents knowing where you go. Run away. Smoke if mother doesn't want you to. Act bold toward parents. Sneak out tonight. Go swimming when mother said "no." Swear. Go on date without permission. Go to show when told not to. Left things when told to do them. Sneak away from house to see boy friend. Ride home with someone I didn't know. Shoot my father's gun. Start father's car. Go in the house with dirty shoes on.

(b). *Adults or legal authority outside the home.* Bust into a house. Break a window. Steal tomatoes. Steal store things. Cross street against light. Wreck an old shack. Knock down grave stones. Ring doorbells. Throw rocks at windows and cars. Shoot at a man. Go past a trespassing sign. Walk in road with car coming. Telling cop where to get off. Cutting people's screens. Set fire to hay stacks. Call a cop a flat head. Shot out street lights. Let air out of tire. Ride in car 60 M.P.H. in 30 M.P.H. speed zone. Go into vacant cottage at beach. Set fire to a field. Pulled up a mail box. Ran through an old man's yard who always shouted and threatened to get the police. Drove car on road when underage. Tell people off or freshness.

(c). *Teachers and school authorities.* Pin a ribbon on teacher. Skip class. Skip school. Walk out of study hall. Answer back a teacher. Wrote on school books. Fly paper airplanes in study hall. Quit school. Put tack on teacher's seat. Knock on class room door. Cheat on exams. Jump chairs in auditorium. Take note off teacher's desk. Throw papers in hall. Tear up homework.

3. *Engage in physically aggressive behavior toward peers of the:*

(a). *Same sex.* Box with a big boy. Knock a boy in the mud. Hit a girl in the face. Bite a girl. Pull a girl's hair. Push a girl down. Tie someone's braids in knot. Put salt and pepper in girl friend's sundae. Hit boy with ball. Put snow down someone's neck.

(b). *Opposite sex.* Hit and kick my brother. Slap a girl's face. Tip over canoe with girls in it. Jump on a boy. Take a boy's hat off. Splash water on a boy. Hit a boy. Beat up a boy.

4. *Engage in socially aggressive behavior toward peers of the:*

(a). *Same sex.* Tell her she is mean. Tell another girl her faults. Ridicule a girl to her face. Tell her off. Flirt with girl friend's boy friend. Ask another girl's boy friend to dance when she is with him. Say something about other girl. Call up girl friend's boy friend. Some girls are dared to break up their friends and their boy friends.

(b). *Opposite sex.* Kiss a girl. Be intimate with boys. Go in girls' lavatory. Go in boys' lavatory. Cut in at dance. Go to movie with boy. Tell a boy I like him. Skate with a boy. Tell girl friend off. Call up boys and disguise voice. Take a girl to movie. Write boy's name in notebook. Sit in boy's lap. Ask boy to go out on dates. Sexual intercourse.

5. *Indulge in random whimsical and socially unconventional behavior.* Kiss tires on car. Ask everybody on street what their name was. Make a foolish call to someone I do not know. Drink milk from a saucer like a cat. Not to talk for the rest of the day. Say strange things to people you don't know. Wear different colored socks. Put sugar in salt. Put nickel on railroad tracks to see what would happen. Tell different people things. Dares of things they know you've never done before.

6. *Risk dangerous and unconventional behavior involving animals.* Pick up a black snake. Ride the horse that kicks and bites. Chase a bull. Pet a strange and vicious dog. Pick up a snapping turtle. Fight a bull. Pick up a bumblebee. Ride a horse that has never been ridden. Ride a cow. Walk over dogs. Play with angry cat. Pick up a bullhead. Eat a frog. Kiss a cat.

7. *Risk exposure to mysterious bizarre circumstances.* Go in dark and stay 10 minutes. Ride through a cemetery at night on a bicycle. Go into places where strange people are. Stay in haunted house until 12 o'clock. To go in a cave. To go through the woods. Break a mirror. Go up in the attic again.

8. *Try difficult or dangerous physical acts.* Walk on thin ice. Jump over fires. Jump from high branch of tree. Jump off roof. Shoot a shotgun shell with hammer and nail. Hold a fire cracker in hand and light it. Swim over my head when just learning. Stand on head on chair. Stay under water for a long time. Jump off the dock. Jump out of the boat. Slide down a rope. Climb a cliff. Walk on roof of rotten house. Put

finger in a vise. Dive into shallow or rocky water. Walk across four-inch rail on a bridge. Jump a train. Jump off ledge. Jump overboard in winter. Staple my hand. Touch a telegraph wire. Drink two glasses of water at the same time. Eat green fruit. Stick a pin through my skin.

Pupil responses to both questions on 54 papers selected at random (three boys and three girls at each grade level) were categorized by two analysts working independently. Employing the conventional formula,

$$2 \times \text{number of agreements}$$

$$\text{total of analyst A} + \text{total of analyst B}$$

the per cent agreement of the two analysts was 90 for the first question and 88 for the second question. Rank-difference correlation coefficients calculated on the categorized responses to the two questions by each grade level

TABLE 2
RANK-DIFFERENCE (RHO) CORRELATIONS BETWEEN THE RESPONSE CATEGORIES OF
QUESTIONS NO. 1 AND NO. 2 BY GRADE AND SEX
($N = 40$ for each sex by grade)

Grade	Sex	Rho correlation
4	Boys	.771
	Girls	.848
5	Boys	.951
	Girls	.907
6	Boys	.934
	Girls	.869
7	Boys	.955
	Girls	.837
8	Boys	.967
	Girls	.876
9	Boys	.801
	Girls	.825
10	Boys	.942
	Girls	.906
11	Boys	.904
	Girls	.869
12	Boys	.942
	Girls	.876

and sex were consistently high and are reported in Table 2. The range of the 18 Rho coefficients is .771 to .967 with an average of .888. Only four of these coefficients are below .85, and only one is less than .80. In short, the frequencies of the dare categories for Question 1 were closely related to the frequencies of the categories for Question 2, thus affording another important measure of the reliability of the categories. Since response cate-

gories for both questions were essentially similar, the discussion to follow will deal with results obtained from the first question.

Table 3 is a summary of the frequency distributions of responses classified in dare categories for all grades combined. The largest numbers of responses are contained in the first five listed categories dealing with risking dangerous physical acts, challenging various authority figures, and indulging in social aggression toward the opposite sex. These categories yielded significant age-grade trends and in some cases interesting sex differences. When all the

TABLE 3
TOTAL FREQUENCY DISTRIBUTIONS OF DARE CATEGORIES FOR ALL GRADES COMBINED

Category	Boys Question		Girls Question		Totals Question	
	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2
Dangerous physical acts (8)	460	406	344	281	804	687
Home authority (2a)	311	198	369	161	680	359
Legal authority (2b)	310	158	176	92	486	250
School authority (2c)	171	74	169	56	340	130
Social aggression, opposite sex (4b)	99	67	241	103	340	170
Whimsical behavior (5)	64	32	93	39	157	71
Physical aggression, same sex (3a)	82	54	43	28	125	82
Dangerous animals (6)	61	48	45	33	106	81
Constructive feats (1)	35	30	41	41	76	71
Social aggression, same sex (4a)	9	5	29	12	38	17
Physical aggression, opposite sex (3b)	7	4	24	21	31	25
Bizarre circumstances (7)	15	13	10	11	25	24
Grand totals	1,624	1,089	1,584	878	3,208	1,967

responses were converted to per cents for each category by grade and sex, the last seven rarely accounted for as much as 10 per cent of the responses at a given age-grade, and no reliable trends were discerned as manifested in Table 4.

The five highest ranking response categories for Question 1 in terms of per cent distributions for each grade by sex are graphically presented in Figure 1. The following results are suggested from this graph based upon responses of 720 rural school children in Grades 4 to 12:

1. There is an increasing tendency with age, highly similar for both sexes, to challenge authority figures in the home. This tendency becomes most pronounced in the adolescent years in Grades 10 to 12.

2. There is a slightly increasing tendency with age (with the exception of inexplicable inversions at Grades 5 and 8) for both sexes to engage in conflict with legal authority. There appears to be a persistent sex difference at all grade levels for boys to be more involved in this conflict. Once more, this problem seems to be somewhat greater in later adolescence.

3. There appears to be a slight tendency with age for increasing conflict

TABLE 4
PER CENT DISTRIBUTIONS OF DARE CATEGORIES AND TOTAL FREQUENCIES BY GRADE AND SEX (QUESTION NO. 1)

Categories	Sex	Grades										
		4	5	6	7	8	9	10	11	12		
Dangerous physical acts (8)	Boys	46.5	35.4	39.1	30.4	40.2	35.4	12.4	15.2	4.2		
	Girls	48.4	39.9	32.8	23.8	20.0	8.0	5.4	3.5	8.9		
Home authority (2a)	Boys	11.6	18.9	10.6	12.0	20.4	16.3	28.0	32.3	25.4		
	Girls	19.5	16.3	17.2	13.5	21.7	20.8	31.2	34.0	39.2		
Legal authority (2b)	Boys	12.4	21.6	16.6	12.4	11.0	21.8	20.2	25.7	29.6		
	Girls	7.4	14.4	11.3	8.6	5.7	12.1	10.2	12.0	16.3		
School authority (2c)	Boys	3.3	2.8	7.4	15.2	6.1	5.4	22.1	6.6	23.0		
	Girls	2.8	3.0	5.9	15.7	11.4	14.7	14.4	17.0	12.6		
Social aggression opposite sex (4b)	Boys	1.7	1.8	6.0	3.7	5.5	10.2	7.8	11.9	8.0		
	Girls	0	0.8	8.8	11.9	17.1	34.8	31.2	24.5	11.8		
Whimsical behavior (5)	Boys	9.1	4.1	4.1	6.4	4.4	2.7	3.9	0.6	0.9		
	Girls	2.8	7.6	10.3	9.7	6.8	4.7	1.8	3.0	2.2		
Physical aggression same sex (3a)	Boys	4.2	5.1	5.5	8.7	6.6	2.0	4.6	5.3	2.4		
	Girls	6.5	2.3	4.4	5.4	2.8	1.3	0.6	0	2.2		
Dangerous animals (6)	Boys	8.3	6.4	6.0	6.4	3.3	2.0	0	0.6	0		
	Girls	5.6	5.7	4.4	5.4	2.3	0	0.6	0	0		
Constructive feats (1)	Boys	1.7	3.2	0.9	2.3	0.6	3.4	0.6	0.6	5.2		
	Girls	2.8	4.9	1.5	1.6	2.3	0	0	4.0	5.2		
Social aggression same sex (4a)	Boys	0	0	0	0.9	0	0	0.6	1.3	1.9		
	Girls	0	0	0.5	1.1	8.0	2.0	4.2	1.0	0		
Physical aggression opposite sex (3b)	Boys	0.8	0.9	0.5	0.5	0.6	0.7	0	0	0		
	Girls	3.7	4.2	2.9	2.2	1.1	0.7	0.7	0.5	0		
Bizarre circumstances (7)	Boys	0.8	0.5	2.8	0.9	2.2	0.7	0	0	0		
	Girls	0	0.8	0.5	1.1	0.6	1.3	0	0	1.5		
Frequencies	Boys	121	219	216	217	183	148	154	152	214		
	Girls	108	260	205	185	175	150	167	199	135		

with school authority starting in the junior high school years and continuing into the senior grade levels. Sharp inversions in the curve for boys during these years may be attributable to sampling error.

4. Risking dangerous physical feats appears to be a relatively more frequent motivation in the childhood years with a sharp decline in relative frequency during adolescence. The curve of decline is steady and persistent

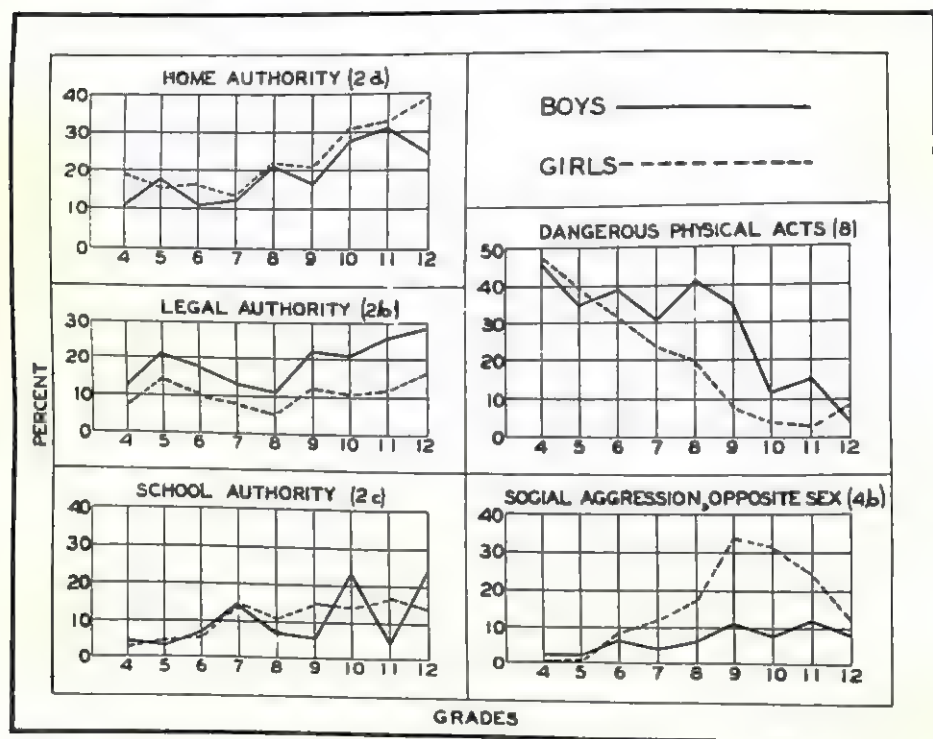


FIGURE 1
AGE-GRADE TRENDS FOR DARE CATEGORIES OF HIGHEST FREQUENCIES
($N = 40$ per grade for each sex)

for girls throughout the age range studied, but for boys the curve starts a precipitate decline only after Grade 9. This value appears to be more important for boys throughout most of the age range, although the high frequencies for girls up to the senior high years should be noted.

5. Risking social aggression toward the opposite sex appears to be a strong feminine value reaching a peak in Grade 9 and declining steadily thereafter until Grade 12 when the frequency approximates that for boys. The disparity between sexes is greatest at Grade 9. Although there is a slight

increase for boys until Grade 9 where a plateau occurs, for the most part females seem to emphasize this value much more than males do.

D. DISCUSSION

The attraction of children and adolescents to dare situations appears to reflect strivings for social esteem, but the content of the dare categories indicates frequent serious personal problems and conflicts appropriate to particular age levels and surrounding cultural circumstances. The dare provides the precipitant or socially generative impulse for acting out latent, but often fundamental tendencies. The element of risk heightens social reinforcement of the final venture, but the behavior tendency or potential appears available from the cumulative effects of the socialization process.

The dare represents a *marginal social value*, because the risk almost universally involves flaunting some generalized social value by means of unorthodox behavior. Obviously from the results indicated above, it would appear that this sort of behavior represents some important degree of acceptability within the *peer subculture*. This subcultural social acceptability, however, may be in serious conflict with more adult and more general patterns of conduct. Thus, challenging various types of adult social authority is both risky and unacceptable in one sense, but enhances the prestige of the adolescent in his peer group as he strives for personal autonomy, a common goal in this age period (4). The dare, then, represents the marginal social value of the adolescent, termed by Lewin (5), the "marginal man." Insofar as children and adults find themselves in marginal situations, they may also be tempted by dare challenges, and implicit barriers may enhance or maintain motivation (7) in the marginally acceptable direction.

The high incidence of risking dangerous physical acts in the earlier childhood years is indicative of a primitive mechanism for enhancing prestige. The major influencing variable appears to be not so much the challenge of personal physical danger, but the *social* prestige for engaging in unconventional behavior viewed with favor by the immediate peer subgroups. Apparently these dangerous, primitive, physical mechanisms are among the few dramatic opportunities for youngsters to gain peer approval. Reeducation to prevent serious childhood accidents as consequences appears desirable. The steady decline in relative frequency of this dare attraction with age reflects rational maturity and the effects of the socially educative process for discouraging this physically dangerous behavior. The more indirect challenge of physical danger in automobile driving remains, however, a serious source of accidents in late adolescence (1).

The shift away from challenging physical danger as the child grows older is not only a function of intelligence and education, but also a function of the broadening channels for social expression. Thus, with increasing age there is the opportunity, albeit risky, of testing social authority, or of taking some initiative for social aggression toward the opposite sex. Peer approval in dare situations becomes contingent upon somewhat more subtle and sophisticated unconventional acts which represent fundamental problems, as in clashes with adult authority.

Challenging legal authority presents a special element of physical risk for many adolescents. Checking the responses *within* this category for Grade 12, it was found that 62 per cent of the male responses and 73 per cent of the female responses involved dares related to automobile driving; total frequencies were much higher for the boys. Driver education in the schools can be viewed as a problem in social motivation, as well as in motor skills and conformity to laws of the road.

The dare situation represents a rather explicit choice between general social values and marginal social values resulting from personal problems and peer pressures. It has been demonstrated in an earlier investigation that children are increasingly able to discriminate with age such enduring social values as honesty, courtesy, respect for others, and coöperation (6). In analyzing the responses to dares from peers, only one socially constructive category from 12 emerged, and this category ranked very low on the frequency scale. The conflicting pressures of marginal versus conventional social values are summarized in the protocol of two adolescents. A Grade 11 boy wrote: "Dares come in two categories—mild and not so mild. The former are such as smoking, petty thievery, vandalism, etc. These are put to you in a matter of fact way when you are part of a gang. The latter may include such as the taking of dope, intimacy with the opposite sex, etc." A Grade 12 girl wrote: "Most people consider dares to mean drinking, smoking, driving at topmost speeds—in a few words being one of the gang. But there is another dare—that of being different, of being the start of a good citizen, of expressing your own opinion."

E. SUMMARY

The content and age trends of 3,208 responses to an open-end questionnaire on dares obtained from 720 rural school children in Grades 4 to 12 were analyzed and interpreted in terms of *marginal social values*. The proportions of dare categories reflecting challenges to various forms of authority increased in magnitude from the childhood to the adolescent years. The

category involving direct challenges to physical danger dropped sharply in relative proportion with age, and was accorded more emphasis by boys than girls throughout most of the age range. Risking social aggression toward the opposite sex was predominantly a female value, reaching a peak for females at Grade 9, and dropping steadily until Grade 12, where the female and male proportions in this category were approximately the same. These and other dare categories of small frequencies in occurrence were interpreted as *marginal social values*, a special type of motivation when incentives possess properties of negative threat as well as positive prestige value. The generative power of this special type of motivation and concomitant conflicts were discussed in terms of hypothetical theoretical properties, as well as practical outcomes in child and adolescent behavior.

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A STUDY OF DEVELOPMENTAL CHANGES IN CONCEPTUAL AND PERCEPTUAL ASSOCIATIVE CLUSTERING*

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A. THE PROBLEM

This study was undertaken with the plan of exploring developmental changes in organizing processes operating in the recall of the items of a stimulus-list. The method was that used for the measurement of associative clustering (2). The essential principles of this method are as follows: A randomized stimulus-word list comprising equal numbers of words in two or more generic categories is presented to subjects for learning. The subjects speak or write the items they recall in the order of their occurrence in memory. Clustering is indicated in sequences of recalled words belonging in the same generic category. The unit of measurement of clustering is the *repetition* which is a succession of two words in the same category. The number of repetitions in a cluster is scored as one less than the number of items in the cluster. This method is essentially one for appraising the tendency of subjects to recall sequences of related words on the basis of principles of relatedness built into the stimulus-list. It cannot measure idiosyncratic bases of relatedness used by the subject. It has been found, however, that adult subjects cluster considerably beyond chance expectation when the operational categories are taxonomic in nature, e.g., *animals*, *professions*, and *vegetables* (2), and when they comprise Kent-Rosanoff stimulus-response pairs (3). Evidence of this type leads us to assume that any two items, *A* and *B*, even when widely separated in a stimulus-list will tend to be clustered in free recall providing they have a direct associative linkage or if they arouse a common response which will serve as a basis for their mediation.

The theoretical rationale of our study starts with the assumption of a progressive increase in the general capacity to organize during the period extending from infancy to adulthood. At the same time, we may expect shifts in the types of organization employed at different ages. Werner (6, pp. 234-243) calls attention to some of these organizational processes.

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According to him, the child learns to perceive the different qualities of objects, and any one of these may serve as the basis of an ordering process. He submits that there is a primitive type of abstraction closely related to sensory organization. With increasing development, however, there emerges a capacity to take multiple categories into account. We interpret observations of this nature to imply that the child, though limited in his organizing capacities, should be relatively more prone than the adult to respond to the perceptual, i.e., sensory characteristics of stimuli and to use these characteristics as a basis for ordering his responses. The adult, on the other hand, should show a stronger tendency to depend on the meanings of stimulus patterns and thus on the conceptual ordering of his responses. Among the perceptual characteristics of stimuli, color has been noted for its impact on children. A study by Lindberg (4) apparently lends support to this supposition. His "Ring" test provided an index of what was called color attitude. Subjects were said to have a positive attitude if they chose color in preference to other bases for distinguishing different types of figures. The percentage of positive attitudes in school children was reported as declining progressively with increasing age.

This analysis led us to plan an experiment permitting a comparison of the incidence of perceptual and conceptual associative clustering in children and adult subjects. Our design involved the use of 25 titled pictures classifiable either perceptually on the basis of five color categories or conceptually on the basis of five categories of meaning. With this arrangement we undertook to test the following three experimental hypotheses: (a) *Older subjects should show a greater total amount of clustering than younger ones.* (b) *Older subjects should show a smaller percentage of color clustering than younger ones.* (c) *Older subjects should recall more stimulus items than younger ones.*

B. METHOD

1. Subjects

The initial plan of the experiment was to compare the performance of a group of college students with that of a group of the youngest school children who would be capable of the performance required in the experiment. We judged that 4th grade children would meet these specifications. Because our judgment turned out to be excessively conservative, we subsequently added a group of 3rd grade children. The composition of the three groups was as follows: Group I, 20 university undergraduates, 7 male and 13 female. Group II, 17 4th grade children, 10 years \pm 5 months of age,

8 male and 9 female. Group III, 15 3rd grade children, 9 years \pm 5 months of age, 7 male and 8 female.

2. Stimulus Items and Apparatus

We selected 25 stimulus-words shown in Table 1. Two principles determined the choice of these words. The object denoted by each word

TABLE 1
STIMULUS-WORDS

Meaning categories	Color categories				
	White	Yellow	Green	Red	Purple
Birds	gull	canary	parrot	cardinal	martin
Fruits	melon	banana	lime	apple	grape
Flowers	lily	daffodil	fern	rose	aster
Nature	snow	desert	meadow	sun	mountain
Vegetables	onion	squash	pepper	radish	eggplant

should readily be classifiable in a category of meaning and should also be readily associated with a distinctive color. We employed a professional artist who painted a representative picture of each object denoted by the words. He first made black and white sketches of the objects and then filled in the appropriate colors using the same pigment for all objects in the same color category. The corresponding words were printed as titles beneath each picture. These pictures were photographed on Ektachrome film for colored slides. For projection of the pictures on a screen we used a standard Selectroslide projector set so as to give a 5-sec. exposure per slide.

3. Procedure

The experimenter worked with each subject individually. First, the subject undertook a preliminary task to permit familiarization with the two bases of clustering. The subject was shown four cards, each containing a colored picture with its title printed beneath. The titles and colors of the pictures were as follows: *Shoe* (brown); *Bear* (brown); *Boot* (black); *Dog* (black). The instructions were to arrange the cards in two groups of two each. After the subject had arranged the cards on the basis of either meaning (animals and foot-wear) or color (black and brown) he was commended. The experimenter then demonstrated the alternative groupings. The subject was then told that a set of similar pictures would be projected on the screen, and that following the projection he was to name as many titles as he could in the order in which they occurred to him. After making certain the instructions were understood, the experimenter

exposed the pictures in a random order derived from a table of random numbers. Recall was started three sec. after the exposure of the final item and continued for five min. while the experimenter recorded the words in their spoken order by means of shorthand symbols. These individual records supplied the data for our statistical treatments.

C. RESULTS

The recall sequences of each subject were first analyzed for the following measures: (a) N , total items produced by the subject including errors and multiple occurrences of the same words; (b) n , number of stimulus-items correctly recalled; (c) R_m , number of repetitions based on meaning, i.e., the measure of conceptual clustering; (d) R_c , number of repetitions based on color, i.e., the measure of perceptual clustering; (e) RR_m , the ratio of repetition for meaning; (f) RR_c , the ratio of repetition for color; (g) T , index of total clustering; (h) P_c , percentage of total clustering attributable to color. The formulas for computing RR_m , RR_c , T , and P_c were as follows:

$$(1) \quad RR_m = \frac{R_m}{N-1} \qquad (2) \quad RR_c = \frac{R_c}{N-1}$$

$$(3) \quad T = \frac{R_m + R_c}{N-1} \qquad (4) \quad P_c = \frac{R_c}{R_m + R_c} \times 100$$

It should be noted that as applied to our data, RR_m and RR_c are not independent measures. A strong tendency to cluster on the basis of meaning would reduce the possibilities of clustering on the basis of color, and *vice versa*. On the other hand, T and P_c may be regarded as independent, and therefore provide a valid test for two of our experimental hypotheses.

Table 2 shows the means of the various measures applied to our data. We employed single-classification analyses of variance to test our experimental hypotheses. In summarizing the results of these tests we shall report the F -ratios obtained from the analyses of variance, and the results of the subsequent t -tests of the differences between the means shown in Table 2.

TABLE 2
MEANS OF INDICES EMPLOYED IN ANALYSES OF DATA*

Group	No. Ss	n	RR_m	RR_c	T	P_c
I—College	20	18.10	.421	.178	.598	29.2
II—4th Grade	17	15.76	.360	.115	.476	25.1
III—3rd Grade	15	13.00	.252	.144	.396	37.8

*See text for definitions of indices and formulas employed in their computation.

The differences for the number of stimulus words recalled, n , yielded an F of 14.66 which is significant at the $< .01$ level. The differences between the means for the groups are significant at the following levels of confidence: I and II, $< .02$; II and III, $< .01$; I and III, $< .01$. These findings confirm our third experimental hypothesis. The differences for T , the index of total clustering, resulted in an F of 9.68 which is significant at $< .01$ level. The results of the t -tests were significant at the following levels: I and II, $< .01$; II and III, .11; I and III, $< .01$. Thus, though less significance is indicated for the result of one of the t -tests, the high F -ratio indicates support for the first of our experimental hypotheses. We turn now to the somewhat surprising results for P_c , the percentage of total clustering attributable to color. While the highest percentage was found for the youngest group as predicted by our second experimental hypothesis, the intermediate group gave the lowest percentage. None of our analyses, however, yielded evidence of significant differences. The F -ratio was 1.45 which gives a P of only .27. The results of the t -tests were as follows: I and II, .23; II and III, .10; I and III, .54. It is thus clear that the data did not support our second experimental hypothesis. The results of our analyses of RR_m , the ratio of repetition for meaning, and RR_c , the ratio of repetition for color require caution in their interpretation because the two measures cannot logically be regarded as independent of each other. The analysis of variance for RR_m yielded an F -ratio of $< .05$. For the t -tests, the following levels of confidence were indicated: I and II, .41; II and III, .05; I and III, $< .01$. These findings suggest that the amount of clustering based solely on meaning varies positively with developmental level. This supports the supposition that changes in conceptual clustering are responsible for the parallel changes in total clustering. As we should expect, the results of the analyses for RR_c also parallel somewhat those for percentage of clustering attributable to color. In this case we obtained an F -ratio of 2.08, significant at only the .19 level. The levels of confidence deriving from the t -tests were as follows: I and II, .05; II and III, .32; I and III, .35.

D. DISCUSSION

As already indicated, the data give support to two of our experimental hypotheses. Both total clustering and the extent of recall of the stimulus-words varied positively with the developmental levels of our subjects. On the other hand, the data clearly failed to confirm the predicted decrease in percentage of color clustering as a correlate of developmental level. Actual-

ly we found the lowest percentage for the 4th grade group and the highest for the 3rd graders. Though these group differences cannot be regarded as significant, they warrant speculation which starts with the question of the existence of other studies yielding results at least parallel to our findings. Interestingly, it appears that the trends indicated by our data on color clustering might have been anticipated if we had based our predictions on two different classes of Rorschach norms.² If we may regard our measure of conceptual clustering, i.e., clustering based on meaning, as an index of a higher level of organizing capacity, there is a parallel in the norms for Z-scores reported by Thetford, Molish, and Beck (5). These scores are regarded as indicative of an intellectual type of organizing activity and correlate positively with developmental level. It may be noted that our experimental hypothesis predicting an increase in total clustering as a correlate of developmental level was based on the assumption that clustering according to meaning should progressively outweigh the contribution of color.

We turn now to the second type of Rorschach norm which is related to our apparently paradoxical finding of the lowest percentage of color clustering for the 4th grade subjects. Our reference is to the ΣC , i.e., the weighted sum of the color responses to the Rorschach blots. Such responses are regarded as belonging in the affective sphere. The norms of Ames *et al.* (1) indicate a progressive increase during the early years. There is a radical drop, however, from the level of 2.09 at the age of nine to 1.51 at the age of 10. Actually the level at the age of 10 is lower than that for any age after four years. Thetford, Molish, and Beck (5) report the following means for the ΣC responses: 6 to 9 years, 1.98; 10 to 13 years, 1.62; 14 to 17 years, 3.03. These norms are interpreted as supporting the conception of a cyclical development of affective responsiveness.

For the authors, the apparent meaningfulness of the findings when considered in the light of the Rorschach literature remains at an interesting speculative level, especially when we realize that our group differences in color clustering did not meet the criteria of acceptable statistical significance. It appears to us that responsiveness to color must depend very much on how it is measured. In an *ad hoc* manner we now reason that the results of the Lindberg (4) study, reviewed in our introduction, which showed a progressive developmental decline in color attitude, may have been due to the restrictions imposed by his method. The choices made by his subjects were between color on the one hand and figural characteristics on the other. In

²We are indebted to Drs. Maria A. Rickers-Ovsiankina and Margaret M. Riggs for calling our attention to the Rorschach approach.

other words, they relied on a choice of perceptual characteristics and did not allow conceptual factors to operate. The younger subjects tended to choose the simpler of the available perceptual means of discrimination. Though we are hesitant in inferring similarities between Rorschach test findings and our measures of clustering, both may be said to deal with conceptual and perceptual modes of reacting. In any event, it appears that color is a highly complex determinant of responses, and research in this interesting area requires caution. We conclude that experimental data relating to the modes of organization of responses should be interpreted with reference to their multiple determinants. The extent of use of any specified means for the ordering of responses probably depends on what other bases of organization are available. We also suspect that what are termed attitudes or sets have appreciable influence, and that such factors not only vary with age but reflect individual differences when the factor of age is held constant.

E. SUMMARY

This study deals with developmental changes in associative clustering when subjects are given the alternatives of clustering on the basis of either conceptual categories of meaning or perceptual categories of color. The following experimental hypotheses were tested: (a) *Older subjects should show a greater total amount of clustering than younger ones.* (b) *Older subjects should show a smaller percentage of color clustering than younger ones.* (c) *Older subjects should recall more stimulus-items than younger ones.* The method involved the use of 25 names of objects printed below their colored pictures. The items were such as to be classifiable on the basis of five categories of meaning (*birds, fruits, flowers, nature, vegetables*) and also on the basis of color (*green, purple, red, white, yellow*). Colored slides of these items were exposed on a screen in random order with instructions to recall as many items as possible in the order of their occurrence in memory. Clustering was indicated by sequences of recalled items belonging in the same category of meaning or color. The subjects were 20 college students, 17 4th grade children 10 years of age, and 15 3rd grade children 9 years of age. Analyses of the data indicated support for the experimental hypotheses relating to total clustering and number of stimulus-items recalled. The results for percentage of color clustering indicated an unexpected inversion with the smallest amount for the 4th grade subjects. Though the results for color failed to attain statistical significance, their trend paralleled Rorschach norms for ΣC scores. The authors conclude that the extent of use of any specified basis for the organization of responses

must depend not only upon the nature of alternative modes of organization, but also upon simultaneously operating sets or attitudes.

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MOTHERS' AND FATHERS' DIFFERENCES IN PARENTAL
ACCEPTANCE OF CHILDREN FOR CONTROLLED COM-
PARISONS BASED ON PARENTAL AND FAMILY
CHARACTERISTICS*

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A. INTRODUCTION

In the past several years there have been five published reports pertaining to the measurement of parental acceptance of children (6, 10) or to the relationships of parental acceptance scores with other characteristics of parents or children (1, 4, 11). One of the findings included among the results reported by Hawkes, et al., (6) was that the mothers included in the study were significantly more accepting of children than the fathers. This finding was based upon a gross comparison of the total sample of mothers and fathers and it seemed that it might be worthwhile to consider refined mother-father differences in acceptance of children for a series of comparisons in which certain characteristics of the parents were controlled. This is the purpose of the present report.

B. METHODOLOGICAL CONSIDERATIONS

Since detailed descriptions of the sample design and the methodology employed in the investigation from which the present data were taken have appeared already (1, 2) only a brief comment on these points is given here. The characteristics of the sample of parents from whom the present data were obtained have also been reported (6).

Descriptions of the Porter Parental Acceptance Scale and its measuring characteristics are available (1, 10). Descriptive data relative to the paren-

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tal acceptance scores for the present sample of parents have also been presented (6), only a brief note related to the parents is presented here.

The 256 couples who composed the sample for the present study all had a child in the fifth grade and at least one other child. The sample design was based upon random selection of fifth grade children and, hence, families. Two criteria for the selection of children were that their parents were living together and that they had at least one brother or sister. When the parents completed the acceptance questionnaire, they were instructed to respond in terms of their feelings and actions toward their fifth grade pupil.

C. THE FINDINGS

The ages and educational levels of the parents, the occupations of the fathers, places of residence, the sex of the children, and the sizes of the families were the characteristics selected as the basis for controlled comparisons of the mothers' and fathers' acceptance scores.

The mean for the total sample of fathers was 132.8 with a standard deviation of 15.8. The mean for the total sample of mothers was higher, 138.4, with a standard deviation of 16.6. The difference in mean scores in favor of the wives was significant at the one per cent level. In the tables to follow total mean scores and sigmas have been omitted for brevity of presentation.

1. *Ages of the Parents*

The means listed in Table 1 show that for each of the age categories used in this analysis the mothers' mean was higher than the fathers' mean.

TABLE 1
MOTHERS' AND FATHERS' MEAN PARENTAL ACCEPTANCE SCORES BY AGE LEVELS OF THE PARENTS

Parents	Under 35			Age levels								
	N	M	SD	N	35-39 M	SD	N	40-44 M	SD	N	45 or over M	SD
Mothers	87	133.9	17.2	68	141.2	14.6	51	137.0	15.9	50	143.5	17.1
Fathers	43	130.0	16.6	63	133.6	16.6	69	131.0	14.7	81	135.2	15.8
Mean differences		3.9			7.6**			6.0*			8.3**	

* Significant at the five per cent level.

** Significant at the one per cent level.

The difference between the mean scores for the parents under 35 years of age was not significant, but the differences in favor of the mothers for the other three age categories were significant.

2. Educational Levels of the Parents

For the comparisons based on the educational levels of the parents, it was possible to match mothers and fathers as couples by educational level instead of using the group controls as in the case of age levels as shown in Table 2. Again the mothers' mean exceeded the fathers' mean for each

TABLE 2
MOTHERS' AND FATHERS' MEAN PARENTAL ACCEPTANCE SCORES BY MATCHED
EDUCATIONAL LEVELS OF THE PARENTS

	Educational levels					
	Elementary 1-8 <i>n</i> = 32		High School 9-12 <i>n</i> = 72		Beyond High School 13-20 <i>n</i> = 36	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mothers	134.8	15.5	134.6	16.2	143.9	15.3
Fathers	131.9	16.4	132.6	15.4	133.7	18.0
Mean differences	2.9		2.0		10.2*	

*Significant at the five per cent level.

of the categories, but only the mean difference between the mothers and fathers whose educational attainment was greater than high school was significant. This difference was significant because the more highly educated mothers had a significantly higher mean score ($P < .05$) than the mothers for the other educational levels.² The fathers' acceptance means showed little variation.

3. Occupation of the Father

Four occupational groups were defined as shown in Table 3. In view of the results observed for the mean comparisons based on educational levels, the mean differences listed in Table 3 were not surprising.

²Porter (11, p. 161) found that educational level was related to the degree to which his sample of 100 parents accepted their children. When the chi square method of analysis he employed was applied to the present data, the mothers' acceptance scores did not show a significant association with the mothers' educational levels ($.10 < P < .20$) but their acceptance scores approached a significant level of association for the classification based upon their husbands' occupations ($.05 < P < .10$), see (6, pp. 198-199). It should be noted that the data for the analysis based on educational levels reported in the present study are not comparable to the data reported in Hawkes, *et al.* (6) since some of the scores for the parents were not used due to the control imposed by use of educational levels. The number of couples used in Table 2 of the present study was 140 while the number of couples used for the analysis reported in Hawkes, *et al.* (6) was 256. The same number of couples were employed in the analysis based on the husbands' occupations in the present study and in the previous study (6). The discrepancies in the findings reported in the two analyses of the mothers' acceptance scores appear to be the result of different methods of analysis and, in the case of educational levels, slightly different data.

The mothers scored consistently higher than the fathers for the comparisons based upon the fathers' occupations, however, only the differences between the mothers and fathers of the business and professional class of

TABLE 3
MOTHERS' AND FATHERS' MEAN PARENTAL ACCEPTANCE SCORES BY THE OCCUPATION OF THE FATHERS

Parents	Occupational categories							
	Business and semi-professional <i>n</i> = 49		Sales, clerical, skilled, semi-skilled workers <i>n</i> = 92		Farm owners and operators <i>n</i> = 70		Unskilled workers <i>n</i> = 45	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mothers	144.2	16.1	137.5	16.6	136.8	16.5	136.4	16.8
Fathers	131.5	14.2	135.3	15.9	131.8	15.1	130.7	18.5
Mean differences	12.7**		2.2		5.0		5.7	

**Significant at the one per cent level.

families was significant. The mothers from the business and professional families had a significantly higher mean ($P < .05$) than the mothers from each of the three groups of families shown in Table 3.

4. Place of Residence

Farm and small town (urban) mothers had significantly higher mean parental acceptance scores than their husbands as shown in Table 4. The rural nonfarm mothers had a higher mean than their husbands, but the difference was not significant.

TABLE 4
MOTHERS' AND FATHERS' MEAN PARENTAL ACCEPTANCE SCORES BY PLACE OF RESIDENCE

Parents	Place of residence					
	Farm <i>n</i> = 77		Rural non-farm <i>n</i> = 131		Urban <i>n</i> = 48	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mothers	137.0	16.8	138.2	16.3	140.8	17.4
Fathers	131.1	14.5	134.7	17.3	130.4	13.2
Mean difference	5.9*		3.5		10.4**	

*Significant of the five per cent level.

**Significant of the one per cent level.

5. Sex of the Child

When the acceptance scores of the parents were classified by the sex of their children, mothers showed significantly greater acceptance of both boys

and girls than fathers. There was no evidence that mothers or fathers were more accepting of children of one sex as opposed to the other sex.

TABLE 5
MOTHERS' AND FATHERS' MEAN PARENTAL ACCEPTANCE SCORES BY THE SEX OF THEIR CHILD

Parents	Boys <i>n</i> = 129		Girls <i>n</i> = 127		Mean difference
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Mothers	137.5	17.8	139.3	14.6	1.8
Fathers	132.1	16.5	133.6	15.2	1.5
Mean difference	5.4*		5.7**		

*Significant of the five per cent level.

**Significant of the one per cent level.

6. Number of Children

Only one of the four tests of the mean differences between mothers and fathers parental acceptance scores listed in Table 6 failed to reach the level of significance.

TABLE 6
MOTHERS' AND FATHERS' MEAN PARENTAL ACCEPTANCE SCORES BY NUMBER OF CHILDREN

Parents	Number of children							
	2 <i>n</i> = 65		3 <i>n</i> = 61		4 <i>n</i> = 59		5 or more <i>n</i> = 71	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Mothers	139.1	15.8	137.6	16.2	137.6	17.6	139.5	17.0
Fathers	132.8	14.5	133.8	15.6	131.2	17.3	133.2	16.6
Mean difference	6.3*		3.8		6.4*		6.3*	

*Significant at the five per cent level.

7. Composite Classification

Frequently in teaching reference is made to various characteristics of the "American family." Usually this ideal construct refers to the urban, middle-class family with middle-aged or younger parents. Except for the urban criterion, it was possible to define a group of parents included in the present sample who approximated these characteristics (*n* = 76). Only those parents who had at least 12 years of education, who were under 45 years of age, and who had not more than four children were included in the composite classification. For these parents, the mothers' mean acceptance score was 138.9 with a sigma of 15.7 and the fathers' mean score was 132.9 with a sigma of 14.7.

The mean difference of 6.0 points in favor of the mothers was significant ($P < .05$).

D. DISCUSSION

The most striking feature about the analyses reported in the present study is that for every mean comparison, the mothers' mean acceptance score was greater than the fathers' mean score. If the composite classification is omitted from consideration since several of the factors tested separately were combined in that analysis, 20 mean differences were tested and 12 were significant. Previous analyses indicated that the mean for the total sample of mothers significantly exceeded the mean for the fathers. Assessment of these controlled comparisons provides a more substantial basis for inferring that mothers are more accepting of children than fathers. In general, it appears that mothers are more accepting of children than fathers, but that younger or less well educated mothers may not be more accepting than their husbands.

An interesting sidelight of the mean score comparisons was that the more highly educated mothers or the mothers whose husbands were business or semi-professional men had significantly higher means than the mothers included in the other categories for these two variables. This suggests that mothers' acceptance of children is related to the socio-economic status of the family. This observation is offered on an extremely tentative basis since the present data permit only loose references to social status concepts. However, sociologists generally agree that the occupation of the husband or head of the house is the single most reliable index of social status (3, p. 15, 9, 12, pp. 181 ff.) and educational attainment is often regarded as a basis of social prestige. Hence, there is some basis for introducing the concept of social class for the purposes of the present discussion.

Other researchers have reported social class differences in mothers' attitudes toward their children and the child rearing practices they employed (5, 7, 8). The present data suggest that perhaps social class differences exist in regard to mothers' attitudes toward their older children as well. It seems that no similar differences exist among fathers' acceptance scores. Additional research specifically designed to test the suggestion of class variations in parents' acceptance of their children needs to be undertaken before the results reported in the present study can be taken with any great degree of confidence.

Our final observation might be made in connection with the unusually high mean scores observed for the better educated and probably higher social status mothers. Anyone who has participated in family life confer-

ences in communities or has spoken before child study groups or parents and teachers meetings knows fairly well that his audience is composed of women who, for the most part, are at least high school graduates and who generally come from the "better" homes of the community. These are generally the women who also read the child rearing articles published in the popular ladies' magazines and who are abreast of the latest pronouncements on how to rear children. Is it possible that these attempts to educate the public in the fine points of family relations and child rearing are reflected in the higher acceptance scores made by the group of mothers in the present sample who probably come from the "better" homes? Those who are engaged in parent education fondly hope so and might draw some encouragement from these findings. The skeptics may wish to interpret these findings as indicating that the "higher status" mothers were better able to identify the correct answer among the alternatives listed after each item.

E. SUMMARY

Previous analysis indicated that the mothers included in the present sample were significantly more accepting of children than their husbands. In the present report, differences between mothers' and fathers' mean parental acceptance scores were tested in a series of controlled comparisons. Characteristics used as controls were the ages of the parents, their levels of education, the occupations of the fathers, places of residence, the sex of the child in the family for whom the acceptance measures were specified, and the number of children in the family. Twenty mean differences between the mothers' and fathers' mean scores as controlled by these factors were tested and 12 of the differences were significant. In all cases, however, the mothers' mean exceeded the fathers' acceptance mean. A composite classification based upon three factors was developed and the mean score for the mothers in this group was also significantly higher than the fathers' mean score. Assessment of the mean differences for these comparisons permitted some refinement of the inference based upon the difference between the means for the total sample of mothers and fathers.

In the process of performing the mother and father mean comparisons, it was observed that the means for the mothers who had more than 12 years of education attainment or the mothers whose husbands were business or professional men were significantly higher than the means for the mothers classified in other categories for these two characteristics. This observation suggested that perhaps mothers' acceptance of children was related to the social status of the mothers. Fathers' means showed very little variation

in relation to the educational and occupational classifications. The present data permit only a very tentative inference in relation to social class differences in mothers' acceptance of children. Further research specifically designed to test this inference is needed before any great degree of confidence can be placed in the present results.

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SHORT ARTICLES AND NOTES

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THE DEFENSE MECHANISMS THAT STUDENTS REPORT IN THEIR OWN BEHAVIOR*

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The defense mechanisms are commonly regarded as unconscious in their operation, because if they were conscious, their purpose of ego protection would not be as effectively served. Yet many individuals are able to accept at least some of their protective devices without too great a threat to their self-esteem, provided that the recognition of the existence of these defenses is not too destructive of an acceptable self-picture.

TABLE 1
DEFENSE MECHANISMS REPORTED BY COLLEGE STUDENTS AS UTILIZED BY THEMSELVES

Defense mechanism	Per cent of students reporting
Rationalization	76.4
Fantasy	42.4
Identification	37.0
Projection	26.4
Compensation	25.5
Regression	20.6
Repression	18.2
Denial	12.1
Displacement	10.6
All others (including emotional isolation, undoing, suppression, withdrawal, reaction formation, intellectualization, introjection, sublimation, substitution, in that order of relative frequency)	30.8

One of the aims of many introductory courses in psychology is a better understanding of the self, and hence many courses include a more or less extended discussion of the defense mechanisms. In one introductory course, an attempt was made to bring the material closer to the student by using a technique (1) that has been advocated for courses in abnormal psychology: the students were asked to write a short paper, illustrating three defense mechanisms that they observed in their own behavior. While clearly such

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a procedure by its very nature could not provide an answer to the question of what defense mechanisms are most frequently *utilized* by the typical college student, and while it further will be affected by the text's (Munn) and lecturer's structuring, discussion, and examples of the defense mechanisms, it could give information about which mechanisms are both used and at the same time not too threatening to recognize, at least in retrospect. Table 1 shows the per cent of 330 students, about half men and half women, who gave instances of a particular defense mechanism as one of the three for which they sought illustration. The writer categorized the obtained behaviors in terms of the classification given in the table, for each student's (signed) paper.

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ASSIGNMENT OF GENDER TO BODY REGIONS*

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A. PROBLEM

In many languages, objects which play no clear rôle in distinguishing between the sexes are nevertheless treated as if they are associated with the masculine or feminine sex. This assignment of gender to objects is presumably metaphoric in origin, i.e., those responsible for the assignment of gender to a given object may have been impressed by the similarity between some facet of that object and some more essential characteristic of one of the sexes. It is of special interest to note the gender assigned to various regions of the human body, since many of these regions are involved, for biological or cultural reasons, in the differences between the sexes.

It is not always easy to predict or even to understand the assignment of gender to body regions (or to other objects) in a given language. The uncertain basis for the assignment of gender is illustrated by the inconsistency which allows one of two synonyms to be treated as masculine, while the other member of the pair is treated as feminine. The assignment of gender is likewise inconsistent from language to language.

Despite these incongruities in the assignment of gender to body regions in various languages, it is of interest to study the spontaneous assignment of gender by Ss who think and speak primarily in a language such as English where objects are not ordinarily considered as masculine or feminine.

B. METHOD

Thirty-three boys (20 seventh-graders and 13 ninth-graders) attending a junior high school served as Ss for this study.

A list of body regions was presented to the Ss in the following order: head, face, eyes, nose, mouth, teeth, chest, abdomen, rear end, arms, hands, fingers, legs, feet, and toes.

Ss were informed that objects are designated as masculine or feminine in

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some languages. After elaborating this idea *E* asked each *S* to indicate which of the foregoing body regions would be designated as feminine or masculine, if *S* were to make up his own language.

C. RESULTS

The masculinity index (i.e., the percentage of responses which are masculine) was computed for each body region; separate computations were made for the seventh and ninth grade *Ss*. When the masculinity indices for these two groups were correlated over all 15 body regions, a product-moment correlation coefficient of $+0.87$ ($p < .001$) was obtained. At the same time, a comparison of the frequencies of masculine and feminine responses for the two groups of *Ss* by means of 2×2 contingency tables (1) failed to reveal significant differences between the two groups for any of the 15 body regions. Since the two groups of *Ss* differ in no significant way, their results have been combined for all further analyses.

The masculinity indices for all *Ss* combined are presented in Table 1. There is considerable variation among body regions, from the chest (re-

TABLE 1
MASCULINITY INDICES

Body region	Index	Rank order of index
Chest	77	1
Arms	76	2
Abdomen	69	3
Feet	64	4
Toes	63	5
Rear end	61	6.5
Nose	61	6.5
Head	58	8
Mouth	45	9
Legs	42	10
Teeth	39	11.5
Hands	39	11.5
Fingers	30	13
Eyes	27	14
Face	25	15

garded as most masculine) to the face (regarded as most feminine). In order to check on the possible effect of the order of presentation of body regions on the distribution of masculinity indices, the ranks of the masculinity indices (see Table 1) were correlated with the order of presentation of the body regions. The obtained *R* of .07 lacks significance.

Inspection of Table 1 suggests several explanations for the manner in which the masculinity indices are distributed. The most promising ex-

planation is that the grossness of a body region accounts, in part, for the degree of masculinity ascribed to that region. A t -test comparing the masculinity indices of the grosser parts of the body (head, arms, legs, chest, abdomen, rear end) with those of the less gross parts of the body (each of which is a subdivision of one of the grosser parts) reveals that the grosser parts of the body are regarded as significantly more masculine than the less gross parts ($t = 2.69, p < .05$).

Two further explanations suggested by Table 1 fail to be verified statistically. The suggestion that body regions which are more familiar to the eye are regarded as more feminine than those which are less familiar to the eye fails to be confirmed. Also refuted is the explanation that the upper regions of the body are regarded as more feminine than the lower regions of the body.

D. DISCUSSION

The findings suggest that sex differences in regard to over-all body size are reflected in the spontaneous assignment of gender to body regions. Such an influence is understandable in our culture, where large males and petite females are rewarded, and where the distinction between gross and petite is frequently found in the expressions, mannerisms, and clothes of the two sexes. Such an influence is even more understandable during the period of pubescence, when gross size is closely associated both with physical prowess and with attractiveness to the opposite sex.

Further light on the variety of factors which influence the assignment of gender might well be shed by examining S 's associations while he is making his assignments. Should knowledge of this sort become available, inconsistencies in the assignment of gender in various languages might become more clearly understandable in terms of the historical conditions prevailing at the time the assignments were first made.

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BOOKS

Now that there is a special *APA* journal completely devoted to the publication of book reviews, it is no longer necessary that other journals emphasize such publication. It has always been our conviction that book reviews are a secondary order of publication unless they carry information that is equally as important as the book. However, the publication of book titles is a very important service, and we shall continue to render that service.

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THE INFLUENCE OF LEARNING IN ACTIVITY WHEEL BEHAVIOR*

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JOHN F. HALL

A. PROBLEM

A number of studies have shown that when rats are placed on a maintenance schedule of 23-hr. deprivation, 1-hr. feeding, their total activity as measured in an activity wheel increases in a negatively accelerated manner, reaching an asymptote at about the 15th day of restricted feeding (2, 3). Assuming that wheel running measures strength of drive, such findings have been used to question the implicit assumption found in many learning experiments that equal, daily periods of deprivation do not result in any systematic change in strength of drive. However, Reid and Finger (5), measuring the activity of the rat in the wheel during the hour just prior to feeding—the hour that would be typically used in a learning experiment—found that on a 23-hr. deprivation—1-hr. feeding cycle, the animal's activity increased not for 15 days, but for 35 days at which time the experiment was terminated. The continued increase in activity suggested to them the possibility that the activity exhibited in the prefeeding hour was a reflection of something other than a progressively increasing drive state. The authors reasoned that running occurring in the hour just prior to the presentation of food would be most strongly reinforced due to the temporal proximity of feeding, and thus, they felt this last hour's activity was, at least in part, a reflection of the S's learning to run.

More recently, these authors have attempted to test this position by giving rats daily access to activity wheels for one hour under 23 hrs. of food deprivation (1). One group was given food in their home cage immediately after each running session, while the other group was not fed until one hour following the activity session. The group fed immediately after having had access to the activity wheel was consistently higher in activity after the eighth experimental day.

This procedure does indicate that an instrumental response such as running in a wheel may be strengthened by following it with reinforcement. However, one difficulty is in generalizing these findings to activity wheel

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behavior in general, for typically the animal lives in the wheel. It is quite conceivable that running during times other than during the prefeeding hour may have some effect (i.e., extinction) on the "learning to run" that takes place during the prefeeding hour. The present study was an attempt to evaluate the rôle of learning in activity wheel behavior during the prefeeding hour in a situation in which the *Ss* are continuously housed in the wheel.

B. EXPERIMENTAL PROCEDURE

1. *Subjects*

The *Ss* were 18 naïve male Sprague-Dawley albino rats, ages 90-100 days at the beginning of the experiment. Four *Ss* were eliminated after the base period for failure to run.

2. *Apparatus*

Eighteen Wahmann activity drums were used. All drums were equated for frictional torque by the method of Lacey (4). The drums were located in a light tight room and upon a macadamized floor. A 12-hr. light (6 A.M.-6 P.M.)—12-hr. dark cycle was maintained. Room temperature recorded continuously with a thermograph averaged 72° F, with a range of 70° to 74°. Daily fluctuations rarely exceeded 1° F.

3. *Procedure*

The *Ss* were placed in the wheels and given an adaptation period of 14 days. Food and water were continuously available during this period. Immediately following the adaptation period, the base period was instituted. This consisted of a 7-day period in which counter readings were taken at 8:00 A.M. and 9:00 A.M. each day. Late in the afternoon of each day, the *Ss* were weighed, and food and water were replenished. At the end of the base period, all food was removed from the cages, and the *Ss* were ranked according to the amount of their mean 24-hr. activity. (Although it would have been more desirable to rank them on the basis of their activity indicated in the 8:00 A.M. to 9:00 A.M. period, the recorded revolutions were so few that it was not practical to do so.) The *Ss* were then paired on the basis of their ranks and a coin tossed to determine which *S* became an experimental *S* and which a control. The experimental period immediately followed the base period and continued for 18 days. The procedure for the experimental period was as follows. Activity continued to be measured from 8:00 A.M. to 9:00 A.M. each day; however, from 9:00 A.M. to 10:00 A.M. the control *Ss* were given access to food while the experimental *Ss* were locked out of the wheel. From 10:00 A.M. to 11:00 A.M. the control

Ss were locked out of the wheel, while food was made available to the experimental Ss. At 11:00 A.M. food was returned to the control Ss and the experimental Ss were permitted to continue to feed. During the feeding hours, all Ss were permitted access to the wheel. At 2:00 P.M. food was removed from both groups. Thus, for the control group, reinforcement immediately followed the activity exhibited during the last deprivation hour. For the experimental group, the last deprivation hour was not followed by reinforcement, but by being locked out of the wheel. It will also be noted that the experimental procedure resulted in both groups being on food deprivation for 19 hours, having access to food for four hours each day, and being locked out of the wheel for just one. Water was continuously available to all Ss, and Ss were weighed daily in the late afternoon.

C. RESULTS AND DISCUSSION

The daily mean activity for the prefeeding hour for the total experimental period for the control group was 41.9 revolutions; for the experimental group, it was 22.9. The signed rank test for paired observations was used to evaluate the differences in activity between the two groups. A *T* of one was obtained, which, with an *n* of 7 pairs, is significant at the .05 level of confidence. Day by day analysis for the 18-day period is illustrated in Figure 1, and provides additional support for the existence of a real difference existing between the activity of the two groups.

If the weight of each *S* on the last day of the base period is used as a reference point against which to compare the *S*'s weight during the experimental period, we find that the deprivation period utilized in the present experiment resulted in little loss of weight. Such losses are not of sufficient magnitude to warrant a detailed analysis. The average weight loss on Day 6 was 1.6 per cent for the control group, and 1.8 per cent for the experimental. On Day 12, it was 1.4 per cent for the control and 2.0 per cent for the experimental group. On the last day of the experimental period, it was 1.0 for the control animals and 1.7 for the experimental group.

Inasmuch as the number of hours of deprivation was constant for both groups, we may assume that the difference in learning has been responsible for the difference in activity between the two groups. It would appear that this assumption is a reasonable one. As the deprivation period lengthens, activity in the prefeeding hour should increase to a relatively high level. Such activity would be reinforced as a function of the nearness of the feeding hour, and should increase to some asymptote as a function of the reinforcement schedule. At this time, it seems impossible to assess the extinction

effects of wheel running which takes place at other times during the day and in the absence of reinforcement.

The experiment demonstrates that the activity exhibited by the rat during the prefeeding hour reflects something more than the operation of an experimentally manipulated drive state. As such, it provides experimental support for an early statement by Shirley (7) that "activity is conditioned by the feeding hour," as well as supports, in part, the theorizing of Seward and

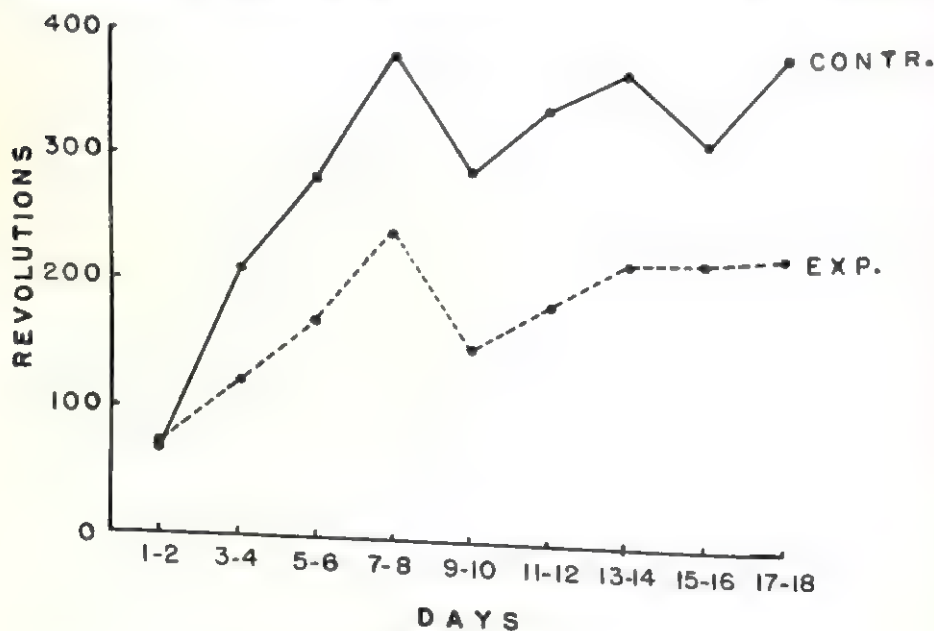


FIGURE 1
DAY BY DAY ANALYSIS OF ACTIVITY WHEEL BEHAVIOR

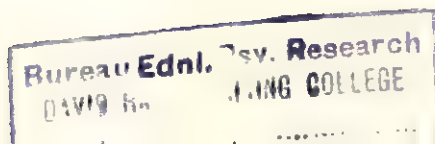
Perlboom (6). It also extends the conclusions of Finger and Reid (1) to include situations in which the animal is continuously housed in the wheel. It would appear that activity wheel behavior cannot be used as an indicator of an animal's drive strength or energy level when a regular deprivation-feeding cycle is used.

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INSIGHT VS. CONDITIONING*

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A. PROBLEM

One of the critical questions which behavior theorists must answer concerns the relative rôles of relationship between insight and conditioning. Hull (2, p. 309) phrases the question as follows: "Is there a single and distinct behavioral element variously called *insight* or *intelligence* which aids the orderly assembly of chain segments beyond the limitations of chance? . . . is (there) a peculiar mechanism called insight or intelligence which has the power of joining, i.e., spontaneously organizing, two behavior chain segments previously learned on separate occasions so that together they will solve a problem faced by the organism at a later time."

Harlow (1, p. 452) states that theorists are divided into two rival camps; the *uni-process theorists* maintain that thinking and reasoning are dependent only upon the formation and appropriate elicitation of a vast number of simple associations. The *dual-process theorists* maintain that thinking is dependent upon some fundamentally different kind of process from that involved in the association of stimuli and responses.

One of the strongest adherents of the dual-process position is Maier (3) who has presented data which he interprets as evidence for insightful behavior in the rat. Insightful behavior is defined by him as "the ability to bring together spontaneously two elements of past experience without having them previously associated by contiguity" (3, p. 46). Hull, while accepting Maier's data, rejects the interpretation, and provides an alternative explanation, suggesting that the two elements of past experience are joined by conditioned fractional goal responses.

Osgood (4, p. 618) points out that Hull's analysis depends upon a certain sequence of training events, which permits the joining of the two elements of past experience through fractional goal response. The sequence, however, could be changed so that Maier would predict that the rats would make "insightful" choices, while Hull would predict that the number of insightful choices would be approximately equal to the number of non-insightful choices. The purpose of this experiment was to evaluate the adequacy

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of the interpretations proposed by Hull and Maier by utilizing Osgood's suggestion. Maier's experiment, with changed training sequences as the only major modification, was repeated.

B. METHOD

1. *Subjects and Apparatus*

The *Ss* were 24 naïve male rats approximately 140 day old at the beginning of the experiment. The apparatus which is essentially the same

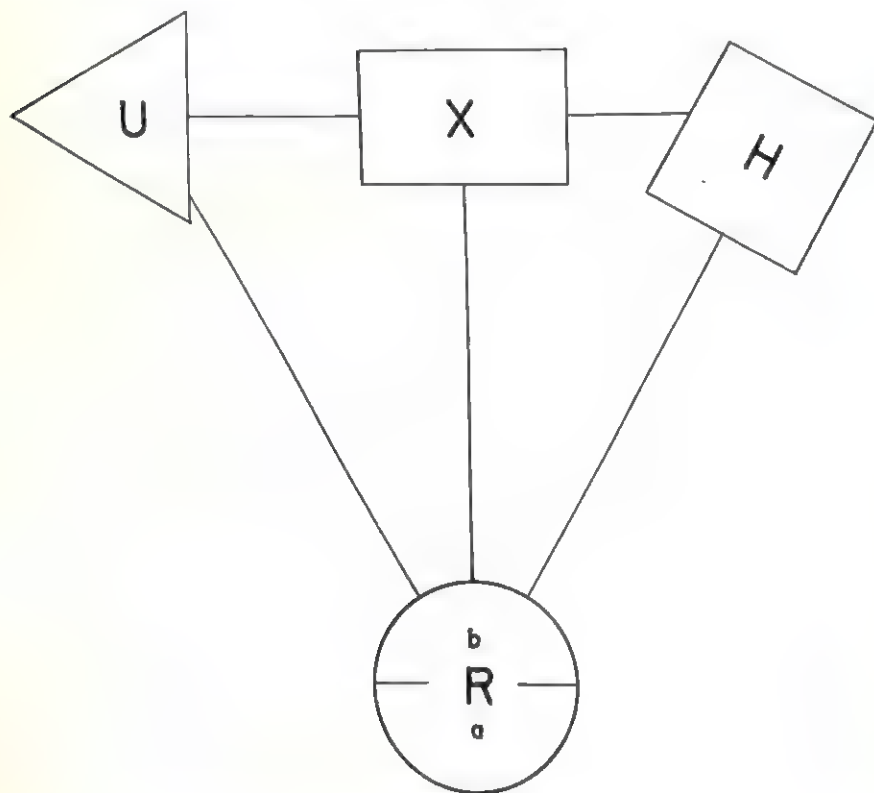


FIGURE 1
THE APPARATUS

as that used by Maier (3) is shown in Figure 1. Four boxes of distinctive shape were connected by identically constructed shielded runways. Distinctive cutaneous stimuli were provided for the animals' feet by using different materials for the floor of each box. The Maier apparatus was modified in two ways. First, a runway was added between *H* and *X* in order to con-

trol for initial direction preferences. Second, a transparent sliding door was inserted across the diameter of *R*.

2. Procedure

The sequence of training was as follows:

1. Thirsty: *R* to *U*, rewarded with water at *U*. Thirsty: *R* to *H*, rewarded with water at *H*.
2. Pretest to determine preferences for either *U* or *H*.
3. Hungry: *R* to *X*, rewarded with food at *X*. Hungry: *U* to *X* (or *H* to *X*), rewarded with food at *X*.
4. Test trial: Hungry; path *R* to *X* blocked.

The *Ss* were approximately 22 hours hungry or thirsty at the beginning of each experimental session. Preliminary training consisted of handling the rat and familiarizing it with the apparatus by placing it in *R* and permitting free access from *R* to *U* and *R* to *H*. Thereafter, when the *S* was being trained on one segment of the apparatus, all other pathways were closed.

3. Water Trials

Each *S*, while thirsty, was given 20 training trials from each of *R* to *U* and *R* to *H*. The order of the trials was randomly predetermined. A trial began by placing the rat in Compartment *a* of Box *R* for 10 seconds before the transparent door was opened. The Maier apparatus was modified to include the transparent door, so that, during the initial delay, the *S* could survey the situation before making a choice. The probability of how and where the *S* was placed in *R* affecting his choice, particularly on the test trial, was thus minimized. After entering the appropriate alley, the *S* remained for 10 seconds in the goal box where water had been placed. The 40 water training trials were distributed unequally over 10 days.

4. Pretest

After completion of the water trials the *S* was pretested to determine whether a preference existed to go to *U* or *H*. The *S*, placed in *R* with both *U* and *H* pathways open, made eight free choices to either *U* or *H*. To minimize the effect of preferences half the *Ss* received food trials against their preferences, and half in accordance with their preferences, i.e., half of the *Ss* indicating preference for *U* were given food training from *U* to *X*, half were given training from *H* to *X*. All *Ss* were given training from *R* to *X*. For clarity of exposition, the phrase *U* to *X* shall hereafter refer

to both U to X and H to X , since the H to X path was included for control purposes only.

5. Food Trials

Each hungry S was given 20 trials from each of R and U to X . The order of trials was randomly predetermined. On each trial the S was allowed to remain for 10 seconds in the presence of food at X .

6. Test Trial

The hungry S was placed at R ; path R to X was blocked. Both paths R to U to X and R to H were open. A record was kept of the number of S s choosing each path.

C. RESULTS AND DISCUSSION

On the test trial 14 S s chose path R to U to X , 10 chose path R to H . The obtained differences would be expected on the basis of chance. These results differ from those obtained by Maier.

The essential difference between our experiment and Maier's is that in his the food trials were given prior to the water trials. The explanation of Maier's data, summarized and adapted from Hull (2, p. 311 f.), is as follows: when the rat is rewarded with food at X the fractional goal response (r_{g_c}) aroused by eating is first evoked by X and then moved back toward R and U respectively, and after several trials is evoked by R and U themselves. When the rat is rewarded with water at U and H the fractional goal response (r_{g_d}) aroused by drinking is in a similar manner first evoked by U and H and then moves back until, after several trials, it is evoked by R . However, each time the rat enters U on the water trials the r_{g_c} which previously moved back from X to U is also evoked. During training, the r_{g_c} previously evoked by X alone then by U moves back through U until it is eventually evoked by R . On the test trial when the hungry animal is placed at R there are equal tendencies based on the r_{g_d} 's to take the path to U or H . But, there is an additional tendency based on the r_{g_c} which moved back from X to U to R for the animal to take the path R to U . More rats would, therefore, be expected to choose the path R to U . Once at U , the old habit of running from U to X is activated, and the problem is solved.

In our experiment since the food trials followed the water trials, there was no opportunity for the r_{g_c} first evoked by X , then by U , to move back from U to R during the water trials, as in Maier's experiment. Consequently, on the basis of Hull's analysis, the tendencies for our S s to take

paths R to U and R to H should be equal on the test trials. Since approximately equal numbers of our S s chose each path, Hull's explanation in terms of conditioned fractional goal responses is supported.

For at least this situation, Hull's analysis of insightful behavior, and consequently the position taken by the uni-process theorists, seems adequate. Here, insightful behavior apparently did not occur because prior learning conditions did not permit the formation of the appropriate simple connections.

D. SUMMARY

Osgood (+) suggested that the adequacy of Hull's fractional goal response explanation of data which Maier (3) interprets as demonstrating reasoning in the white rat, could be tested by changing the sequence of training trials. This experiment designed to utilize Osgood's suggestion, provided no evidence of insightful behavior. The results are interpreted as evidence in favor of Hull's explanation of insightful behavior in terms of fractional goal responses.

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THE EXPRESSED VALUES OF INSTITUTIONALIZED DELINQUENT BOYS*

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A. PURPOSE

Anthropologists (15, 23, 45), sociologists (2, 22, 25, 46), psychologists (1, 13, 28, 29, 38, 40, 44), and members of other disciplines (5, 12, 16, 20, 42) have become increasingly interested in the study and understanding of values and their influence on human behavior. The general notions (a) that values operate as criteria for making judgments between alternative courses of action (27, 34, 46, 48); (b) that many behaviors in various activity spheres can be understood and predicted only if the underlying values are known (15, 19, 23, 45); and (c) that an individual's values directly influence his behavior and the quality of his decisions (8, 14, 32) have been supported by numerous inquiries.

Solomon (41), Roman (36), Kobrin (22), Tappan (43), Reifen (33), and other investigators (7, 9, 11, 24, 30, 47), interested in the causes and prevention of juvenile delinquency, have emphasized that value problems—conflicts in values, competing dualities of cultural values and norms, adherence to amoral values, and vaguely defined values and norms—are to be included among the basic causes of juvenile delinquency. Following this lead, other writers have suggested that effective delinquency prevention programs should include the goal of affecting the values by which the child lives (4, 16, 18, 31) through the reorganization of community and other programs which reaffirm and foster acceptable values and norms (6, 22, 24, 35, 47). These various proposals for delinquency prevention programs are based upon the assumption (stated or assumed) that the values of delinquent youngsters are amoral (18, 30, 39), inconsistent (35, 47), unconventional (6, 22, 41), or characterized by a condition of "anomie" (9, 24), as contrasted to their non-delinquent, law-abiding peers. However, several empirical studies (3, 17), reported in 1935 and 1936, showed no differences between the values of delinquents and the values of non-delinquents.

The purposes of this present study were threefold:

1. To explore the expressed personal values of a group of institutionalized delinquent boys.

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2. To explore these boys' expressed family and peer values.
3. To analyze these values for conflicts between self, peer, and family and for differences among whites, Negroes, and Puerto Ricans.

A perusal of the literature reveals that values have been defined in three major ways by the various writers. First, values have been defined in terms of objectives, goals, achievements, gratifications, or other referents which are a person's idea of that which is desirable and what he and others ought to want (10, 19, 21, 29, 37). Secondly, values have been defined as desirable objectives, goals, achievements, gratifications, or other referents *plus* the process, methods, ways or *norms* for their achievement (2, 42). And lastly, values have been defined as abstract orientations such as the aesthetic, religious, theoretical, political, etc., which underlie behavior and can only be inferred or abstracted from behavior (1, 27, 28, 38, 40, 46). In this study the term value was defined in the first sense: as those qualities and achievements which were expressed by subjects relative to family, peer and self concepts of values.

B. METHODOLOGY

1. *Subjects*

The subjects of this study consisted of 60 boys, 20 whites, 20 Negroes, and 20 Puerto Ricans, selected from an institutional population of about 480 boys at the New York State Training School for Boys. All boys had been living in New York City at the time of commitment. All white and Negro boys were born in the United States, 19 of the 20 Puerto Rican boys were born in Puerto Rico. Boys were matched in sample selection so that certain differences between the three ethnic groups were controlled. The following seven factors were controlled: (a) intelligence, as measured by the Wechsler-Bellevue Scale, (b) age, (c) length of stay in the training school, (d) the presence or absence of the natural mother and natural father in the boy's home at the time of his commitment, (e) number of siblings, (f) pattern of delinquency offenses, and (g) the family's income at the time of commitment.

After the sample was selected, the boys were divided into ethnic groups and each matching factor was assessed using the Chi-square test. There were no significant group differences for the seven factors. For example, Table 1 shows tests of significance of differences among the three groups for age, presence or absence of the natural mother and father, length of training school stay, and number of siblings at time of commitment to the training school. The total group may be described as follows: the range

of intelligence scores was from 57 to 104 with a mean of 84. The mean age was 13 years 9 months with a range from 12 years 2 months to 16 years 7 months. The average length of stay at the training school was 7 months 27 days with a range of 1 to 19 months. In 44 homes of boys at the time of commitment, the natural father, the natural mother, or both were missing. The median number of siblings was 2 with a range of 0 to 12 siblings. The most common patterns of offenses committed included stealing ($N = 30$),

TABLE 1
ANALYSIS OF FOUR DIFFERENCES AMONG THE THREE ETHNIC GROUPS FOR MATCHED FACTORS

Control factor	Number of boys				Chi-square
	White	Negro	Puerto Rican	Total	
Age (in years)	15+	5	4	7	16
	13.7-14.11	7	8	5	20
	12-13.6	8	8	8	24
	Total	20	20	20	60
					1.93*
Both parents in boy's home One or both parents missing		7	2	7	16
		13	18	13	44
	Total	20	20	20	60
Length of stay in training school (in months)					4.27**
	13+	4	4	4	12
	7-12	8	6	8	22
	1-6	8	10	8	26
	Total	20	20	20	60
An only child 1-2 siblings 3 or more siblings					.61*
		5	4	3	12
		5	5	11	21
		10	11	6	27
	Total	20	20	20	60

*A Chi-square of 9.49 was significant at the .05 level of probability (4 df).

**A Chi-square of 5.99 was significant at the .05 level of probability (2 df).

truancy ($N = 16$), incorrigible behavior ($N = 15$), and burglary ($N = 10$). The financial support for 24 boys' families came from relief (welfare, aid to dependent children and the like); in 36 cases, the family annual income was less than \$3,000 per year. The two most common occupations of the working adults in the 36 self-supporting households included janitors or domestic servants ($N = 6$) and factory workers ($N = 13$).

2. Method Employed

Barron (2) has suggested the desirability of a methodology for studying values which will elicit the subject's naïve utterances rather than the investigator's preconceived notions. Applying this approach, a simple structured

interview, similar in construction to those of Rose (37) and Wilkening (46), was employed. Eleven questions were asked, with relatively free probing by this investigator. The three questions relevant to family, peer, and self values respectively were:

1. Name three qualities or achievements you might have when you become an adult for which you think your parents would praise you.
2. Name three qualities or achievements you might have when you become an adult for which you think your friends would praise you.
3. Name three qualities or achievements that you yourself would like to have as an adult.

A total of 540 responses, including *Don't Know's*, were abstracted from interview protocols and first grouped according to 16 value categories. The 16 categories served as a convenient point at which to begin categorizing. Following this preliminary categorization, response categories were re-examined and the number of categories reduced to 11. To check the reliability of the categorization process, three psychologists were given the 540 responses and asked to categorize the responses into the 11 categories. The three psychologists differed on how to categorize 39 of the 540 responses. However, by subdividing one category, character traits, into outer- or inner-directed character traits, the number of disagreements among the three judges was reduced to only four. It could therefore be assumed that responses could be reliably categorized according to the final 12 categories.

These value categories and examples of responses are listed below:

1. Material Possessions—"a good house," "a car," "money," "lots of money," "lots of good clothes," etc.
2. Occupation—"a good job," "a regular job," "be an engineer," etc.
3. Be a Law-abiding Citizen—"stay out of trouble," "obey the laws," etc.
4. Be a Good Family Member—"take care of my mother," "give my father half my salary," "help around the house," etc.
5. Have My Own Wife and Family—"have a nice family of my own," "get a good wife," "have my own family," etc.
6. Character Traits (outer-directed)—this category is based on Reisman's (34) hypothesis and included emphasis on helping others or outer-directed traits—"helping my friends solve problems," "loaning or sharing money with others," "treating others nice," etc.
7. Character Traits (inner-directed)—this category is based too on Reisman's hypothesis and includes emphasis on self—"be a nice guy," "be a good person," "be a good man," etc.

8. Become a Celebrity—"be a hero," "be great at something," "be a great professional baseball player," etc.
9. Popularity—"have many friends," "have lots of companions," etc.
10. Education and Intelligence—"get more schooling," "go to college," "do well in school," "be smart," etc.
11. Miscellaneous—including only "have fun," "keep myself clean and neat," and "serve my country."
12. Don't Know—"I don't know."

C. RESULTS

1. *Most Common Values*

Table 2 shows the expressed family, peer and self values, by accumulating choices for all boys. It shall be assumed that the more frequently a value is mentioned, the greater its relative importance. In the analysis of the achievements and qualities, one question arose: Should all three choices be used or only first or first and second choices? It should be noted that the most commonly expressed family values for first choice were "occupation"; for first and second choices, "occupation" and "being a good family member"; and for all three choices, "being a good family member," "occupation," "don't know" and "being a law-abiding citizen." By employing all three choices for each boy, the accumulated choice totals yield a more complete picture of the values of subjects. For this reason the results which follow will be reported in terms of all choices made by subjects.

Examining all the values expressed, ignoring family, peer, or self, Table 2 shows the most frequently mentioned value category to be *Don't Know*. *Don't Know's* occurred 20 per cent of the time. This finding appears to support those who have suggested that some delinquents tend to be valueless and not knowing what they want, do not know how to attain their wants (9, 24, 47). The most infrequently mentioned values included popularity, becoming a celebrity, and education and intelligence.

The most commonly expressed family values included: (a) Being a good family member, (b) Occupation, (c) Don't know, and (d) Becoming a law-abiding citizen. However, of the 42 subjects who mentioned "becoming a good family member," 27 subjects mentioned specifically that the way to become a good family member was by giving money to the family. The most commonly expressed peer value was character traits (outer-directed). The most commonly expressed self-values included: (a) material possessions and (b) occupation.

The results of Table 2 might be summarized in this way: most of the boys'

family responses emphasized the materialistic aspects of being a good family member, obtaining a job, and staying out of trouble with the law. Most of the boys' peer responses were in the area of outer-directed character traits—loaning money to friends, doing favors for friends, spending money on friends, loyalty to friends, etc.. The boys, themselves, valued material possessions, particularly cars, and "a job." At the same time, some boys apparently did not know what was valued by peers, family, or self. It should be noted that the greatest frequency of *Don't Know's* occurred in response to the exploration of peer values.

1. *Ethnic Group Differences in Values*

Table 3 shows the family, peer, and self-values organized according to ethnic group. It should be recalled that 19 of 20 of the Puerto Rican boys were born in Puerto Rico, however, these boys in common with the white and Negro boys had extremely deprived socio-economic backgrounds. From a perusal of Table 3, it seems clear that there were no significant value differences between the three ethnic groups. The spread of responses within each group was greater than the differences between groups. The family responses from each group emphasized being a good family member and occupation. The peer and self responses of each group emphasized character traits (outer-directed) and material possessions and occupation, respectively. Apparently, the similarity in environmental experiences was a far more pervasive determinant of values than the subjects' ethnic group.

2. *Group Value-Conflicts*

Table 4 shows the conflict scores and the rank order for conflict scores for all subjects. The arithmetic difference between the total choices was expressed for each category as a conflict score for family-peer, family-self, and peer-self values. It was assumed that the larger the differences in choices, the greater the conflict.

In terms of the total group conflict scores, the greatest conflict was between peer group values and self values of subjects ($D = 248$). The least conflict was between subjects' personal values and family values ($D = 154$).

The largest conflict between self-values and the values of the family involved the categories: material possessions, being a good family member, and becoming a law-abiding citizen. Possessing material possessions is held in high esteem by the boys but apparently not by the families; whereas being a good family member and becoming a law-abiding citizen are emphasized by the families but not by the boys. Both boys and families seemingly agree

that inner-directed character traits, becoming a celebrity and education and intelligence were relatively unimportant as goals.

The greatest conflicts between self and peer values involved material possessions and outer-directed character traits. Material possessions occupied a high place in the boys' value hierarchy, whereas this value was less important to peers. Conversely, possessing outer-directed character traits occupied a prominent position in the peer-group value hierarchy, whereas this category was infrequently mentioned as a boy's

TABLE 4
CONFLICT SCORES FOR ALL SUBJECTS FOR ALL RESPONSES EXPRESSED IN RANK ORDER

Values	Family—Peer Diff.	Peer—R.O.	Family—Self Diff.	Self—R.O.	Peer—Self Diff.	Self—R.O.
1. Material possessions	1	10.5	62	1	61	1.5
2. Occupation	31	3	3	7.5	34	4
3. Become a law-abiding citizen	10	7	20	3	10	6.5
4. A good family member	42	2	35	2	7	8
5. Have own wife and family	11	5.5	5	6	16	5
6. Character traits (Outer directed)	61	1	0	11	61	1.5
7. Character traits (Inner directed)	1	10.5	3	7.5	2	10
8. Become a celebrity	11	5.5	1	10.5	10	6.5
9. Popularity	2	9.5	6	5	4	9
10. Education and intelligence	2	9.5	1	10.5	1	11.5
11. Miscellaneous	3	8	2	9	1	11.5
12. Don't know	25	4	16	4	41	3
Totals	200		154		248	

important self-value. In the areas of inner-directed character traits, education and intelligence, there was little conflict between peer and self, both groups apparently attaching little importance to these values.

3. Conflict Scores and Ethnic Groups

What were the differences, if any, among conflict scores for the three ethnic groups? Table 5 depicts the conflict scores and rank order of conflict scores for the three ethnic groups. An examination of the family-peer conflict scores' rank orders shows little difference, other than chance variations, among the three ethnic groups. The greatest family-peer conflict for all three groups was due to the emphasis the peer group placed on outer-directed character traits and on the relative low emphasis given by the family to this value.

The rank order of family-peer conflict scores for the three ethnic groups seemed to follow the same pattern. To assess the relationship between

TABLE 5
CONFLICT SCORES FOR WHITE, NEGRO, AND PUERTO RICAN BOYS IN RANK ORDER

	Family—Peer						Family—Self						Peer—Self					
	N		W		PR		N		W		PR		N		W		PR	
	No.	R.O.	No.	R.O.	No.	R.O.	No.	R.O.	No.	R.O.	No.	R.O.	No.	R.O.	No.	R.O.	No.	R.O.
1. Material possessions	2	8.5	4	8	1	8	21	1	18	1	23	1	23	1	14	4	24	2
2. Occupation	11	3	10	2.5	10	4	1	8	5	5	1	7.5	10	3.5	15	3	9	4
3. Become a law-abiding citizen	1	10	8	4.5	1	8	5	3	9	3	6	3	4	6	1	9.5	5	5.5
4. A good family member	13	2	10	2.5	19	2	12	2	8	4	15	2	1	9	2	7.5	0	11.5
5. Have own wife and family	3	6.5	4	8	4	5	0	10.5	4	6.5	1	7.5	3	7	8	5	5	5.5
6. Character traits (Outer directed)	17	1	18	1	25	1	0	10.5	1	10	0	11	17	2	17	2	25	1
7. Character traits (Inner directed)	1	10	2	10	0	11.5	0	10.5	0	11.5	3	4	1	9	2	7.5	3	7
8. Become a celebrity	6	4.5	6	6	1	8	0	10.5	3	8	0	11	6	5	3	6	1	9.5
9. Popularity	1	10	1	11	0	11.5	2	6.5	2	9	2	5	1	9	1	9.5	2	8
10. Education and intelligence	3	6.5	0	12	1	8	3	5	0	11.5	1	7.5	0	11.5	0	11	0	11.5
11. Miscellaneous	2	8.5	4	8	1	8	2	6.5	4	6.5	1	7.5	0	11.5	0	12	7	9.5
12. Don't know	6	4.5	8	4.5	11	3	4	4	12	2	0	11	10	3.5	20	1	11	3
Totals	66		75		74		50		66		53		76		83		86	

ranks, rank-order coefficients of correlations (26) were computed for the relationship of family-peer conflicts between: (a) Negro and white boys; (b) Negro and Puerto Rican boys; and (c) white and Puerto Rican boys. These three rank order correlations were .79, .91, and .85 respectively and statistically demonstrated the similarity of family-self conflicts among the three groups.

Rank order correlations were computed for family-self conflicts and were found to be .78 for the Negro and white boys; .66 for the Negro and Puerto Rican boys; and .40 for the white and Puerto Rican boys.

For the least area of conflict, between peers and self, the three correlations were consistently higher. For peer-self conflict, the rank order correlations between Negro and white boys, between Negro and Puerto Rican boys, and between white and Puerto Rican boys were .86, .87, and .80 respectively. The nine correlations indicated that the subjects of the three ethnic groups shared similar value conflicts.

D. DISCUSSION

The over-all results of this exploration suggest several implications for those interested in understanding the delinquent and his values. First, 20 per cent of value responses fell in the *Don't Know* category. In a similar study by Rose, employing rural high school youth in Minnesota, approximately nine per cent of male subjects (39, p. 361) reported *Don't Know's* in response to value questions concerning family, peers, and self. The higher incidence of *Don't Know's* among the delinquent boys of this inquiry suggests that the boys have not learned values. Martin (29) and others (30) have pointed out that the process of the development of values in children involves taking on the value characteristics of significant adults in the child's environment with whom the child identifies. From this perspective, the lack of values may be attributed to interpersonal problems such as: (a) the lack of values of those with whom the child identifies; (b) the lack of identification of the seemingly valueless boys with significant adults; or (c) poor communication between boy and significant adult. Whether any one of these suppositions is valid is a matter for future research.

While it may be true that some subjects have not learned values, other *Don't Know* responses may have been due to factors associated with the lack of acceptance of a set of family, peer, or personal values. Many writers (7, 22, 30, 36, 41, 43, 44) have previously explored and described the multiplicity of values, the duality of value systems which exists in schools and neighborhoods, and the competing and conflicting value systems which appar-

ently typify the complex, urbanized community from which the subjects of this study were drawn. Within this cultural context, lack of acceptance of a systematic set of values could be attributed to: (a) the subjects' general immaturity and inability to wisely select alternative value orientations; and (b) the subjects' lack of exposure to a consistent uniform set of values.

A second implication of these results deals with the type of family and self values the boys expressed. Primarily, both self and family values appeared to be strongly materialistic and gratification-directed. Considering the extremely deprived socio-economic backgrounds of these subjects, this finding is hardly surprising. However, it should be recognized that other inquiries employing subjects from more favorable socio-economic backgrounds have found strong tendencies for American youth to aspire to materialistic or gratification-directed goals (11, 39).

That the possession of inner-directed character traits occupied a relatively low place in the self and family value hierarchies of subjects supports Reisman's (34) hypothesis that outer-directed characteristics are more highly valued than inner-directed traits among Americans. A recent study of social values by Farber (13) indicated that American fathers, as compared to English fathers, tended to more highly regard the development of outer-directed social values in their children. Presumably, many of the subjects of this study like their non-delinquent peers have successfully learned this American cultural devaluation of inner traits.

Thirdly, there were no differences other than chance fluctuations between the values and value-conflicts of the three ethnic groups studied. Apparently the similarities in environmental experience were a far more pervasive determinant of values than were factors related to the subjects' ethnic group. The largest conflict for all boys was between their own values and the values of their peers. Boys valued material possessions highly, the boys' peers valued outer-directed character traits highly; whereas the former trait was not valued highly by peers, while the latter trait was not valued highly by boys.

Finally, the main implications of this study are its insights into the value problems of delinquents and solutions to this issue. Some writers have reported that the delinquent has a systematic set of values (11, 30) and that one of the ways of helping the delinquent is to provide a structure in which he can learn the means for achieving his values and incentive using socially-acceptable ways (42). The results of this study clearly indicate that these subjects need help: (a) in discovering some personal values which are meaningful to themselves; (b) in clarifying and gaining insights into their own value-conflicts; (c) in gaining a fuller understanding of and appreciation

of more socially-acceptable methods for attaining goals; and (d) in gaining in appreciation and acceptance of non-materialistic, moral, and spiritual values.

Several hypotheses should be proposed for future research:

1. That "valuelessness" will tend to be related to: (a) the lack of identification with significant others, (b) the "valuelessness" of the significant others.

2. There will tend to be a greater conflict between an adolescent's values and the values of his peers than between an adolescent's values and the values of his family.

The findings of this study should be regarded as tentative due to the limited size of the sample, unique characteristics of the institutionalized delinquent, the methodological approach which was limited to verbally-expressed values, and artifices inherent in the phenomenological approach. Whether or not the results can be validly generalized to similar or dissimilar adolescent populations is a matter for future research.

E. SUMMARY

The purposes of this study were threefold: (a) to explore the expressed self values of 20 Negro, 20 white, and 20 Puerto Rican institutionalized delinquent boys; (b) to explore these boys' expressed family and peer values; (c) to analyze these values for conflicts between self, peer, and family and for differences between whites, Negroes, and Puerto Ricans. The term *values* was defined as those qualities and achievements which were expressed by subjects relative to family, peers, and self. Value data were gathered by the interview method. The ethnic groups were matched so that there were no significant differences between the white, Negro, and Puerto Rican groups for: intelligence, age, length of stay in the training school, the presence or absence of the natural mother and natural father in the boy's home at time of commitment, number of siblings, patterns of offenses committed, and the family's main source of income at times of commitment.

The major findings of this study may be summarized as follows:

1. Examining all values expressed, ignoring type, the most frequently mentioned value category was *Don't Know*. This finding suggested that 20 per cent of the delinquents tended to hold no strong values.
2. There was no significant difference in expressed family, peer, or self values between white, Negro, and Puerto Rican boys. Differences within groups were greater than differences between groups.
3. There were no significant differences between ethnic groups for value

conflict scores. The largest value conflict scores were between a boy's self-values and the values of his peers; the smallest conflict scores were between a boy's self-values and the values of his family.

4. Primarily, both self and family values of boys seemed to be strongly materialistically and gratification-oriented. The most frequently mentioned self-value involved material possessions—owning a car, having lots of money, owning a house. The most frequently mentioned family value involved being a good family member. However, of the 42 subjects who mentioned "being a good family member" as a family value, 27 subjects specifically mentioned that the way to become a good family member was to give to the family.

5. The most frequently mentioned peer value involved outer-directed character traits—helping others, loaning others money, doing favors for others, etc.

6. The largest self-family conflict scores were attributable to the boys' high appraisal of material possessions and comparatively low appraisal of being a good family member.

7. The largest family-peer value conflict scores were attributed to the peer group's high rating for outer-directed character traits as opposed to the families comparatively low ratings for this trait.

8. Inner-directed character traits, and education and intelligence were infrequently mentioned as self, peer, and family values. Apparently these values were relatively unimportant to the subjects' and the families' value hierarchy.

9. The results of this study indicate that these boys need help: (a) in discovering some personal values which are meaningful to themselves; (b) in clarifying and gaining insights into their own value-conflicts; (c) in gaining an appreciation and acceptance of non-materialistic oriented, moral, and spiritual values; and (d) in gaining a fuller understanding and appreciation of more socially acceptable methods for attaining goals.

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CHILDREN'S PERSONALITY ADJUSTMENT AND THE SOCIO-ECONOMIC STATUS OF THEIR FAMILIES*

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A. PURPOSE

The socio-economic status of the family in which the child is born and socialized has been demonstrated to have important influences on the attitudes, values, and behavior patterns acquired by the child.² The purpose of this paper is to present data on the relationship between several indices of family socio-economic status and the personality adjustment of a sample of rural and small town fifth-grade children. The findings of the present investigation should be of interest since most of the previous studies were conducted with urban children.

If the results of previous studies (13, 14, 17, 19, 23, 28, 33) can be applied to the present investigation, the following general hypothesis should be supported by the present data: rural and small town children coming from higher socio-economic status families show fewer indications of personality maladjustment as compared with children from families of lower socio-economic status.

B. METHODOLOGY

The Rogers Test of Personality Adjustment (31) was administered to the 256 children who comprised the sample for this study. The novel, indirect, varied, and disguised testing methods used in this test permit the child a wide range of possible responses to the various test sections. Four sub-scores, feelings of personal inferiority, social maladjustment, family relationships, and day dreaming are derived from the Rogers test. Definitions of these scores are given by Rogers (31) and by Remmers and Gage (30).

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²All the available research supporting this proposition is too numerous to cite. Several bibliographies supply references to the less recent studies of socio-economic variables and their relation to numerous personal and social characteristics, see Bailey *et al.* (3), Cattrell (7), and Pfautz (29). A recent article by Sewell and Haller (33) also contains extensive references.

Reliability coefficients ranging from .65 to .72, based on 43 children who were retested after a one-month interval, were reported by Rogers for the five scores. In this study, reliability coefficients based on retests at a one-week interval for 51 children ranged from .67 to .77 for the five scores. The results of the three validity tests reported by Rogers appear to give sufficient basis for group use of the test (31, p. 80).

A stratified probability sampling design was used to select the 256 children who completed the Rogers test. These data were gathered as part of a larger study of parent-child relations for which the sample described here was designed (6, 20). Since detailed descriptions of the sample design and its execution are available elsewhere (5, 6, 20) only a brief note is given here.

Four states, Iowa, Ohio, Kansas, and Wisconsin, formed the initial stratification. Within each of the four states, two strata of population, rural and cities in the 2,500 to 10,000 population range, were defined. Eight sampling points, defined as elementary schools and divided between the two strata in each state on the basis of the relative sizes of the strata, were drawn for each state sample by a probability method.³ Schools were used as the basis of the sample design because children are regularly assembled in schools and are readily accessible. Eight children were selected at random from the fifth grade class or classes at each of the sampling points. Criteria for the selection of children were that the children came from "whole" families in which both parents were living together and that the children had at least one brother or sister.

The children completed the Rogers test in their classrooms under the direction of one researcher who did all the testing during the 1954-55 academic year. There were 129 boys and 127 girls in the sample; detailed descriptions of the sample characteristics may be found in other sources (5, 6, and 20).

No effort was made during the field-work portion of this research project to obtain detailed information related to the socio-economic position of the families. Hence, it was not possible to estimate the socio-economic status of the families by means of techniques developed by Chapin (9) or Sewell (4, 32). However, data relating to several commonly used indices of socio-economic position were gathered. In this study, the occupations of the fathers and the educational levels of the fathers and mothers are taken as indices of the socio-economic placement of the children's families.

³General references for this type of sample are Cochran (10) and Hansen, Hurwitz, and Madow (16). For the details of stratifications imposed and the probability scheme followed, see Burchinal (5, Chapter III, "Methodology").

Because of the smallness of the sample and the limited segment of the occupational structure which was sampled due to the rural and small-town stratifications employed, one of the conventional occupational classification schemes could not be used and a classification scheme which seemed most usable with the present data was developed (see Table 1).

Only three fathers, a lawyer, surgeon, and minister, were considered professional men in the strict meaning of the term. These fathers were combined with the business and "semiprofessional" occupations such as retail store managers, small store owners, teachers, pharmacists, and accountants to form what is considered as the high socio-economic class of families for this sample.

Skilled and semiskilled workers were combined into an intermediate category. The lowest occupational group were the unskilled agricultural and nonagricultural workers. A special word needs to be said about the farm owners or operators. Unfortunately no additional data pertaining to socioeconomic levels were available for this group of families. Since children whose fathers were in this group may have come from comparatively high status families or from comparatively low status families this group was not included in this analysis.

It is recognized that the categories for analysis are coarse and represent arbitrary classifications of occupations. But if one assumes, and there is accumulating evidence to support the assumption, that the American social stratification system is best described as a continuous system in which any divisions of the population into social classes is purely arbitrary, then it is recognized that for research purposes any classification which permits greatest utilization of data is entirely acceptable. The continuum of social classes, of course, stands in contrast with the discrete theory of social classes which has been advanced by Warner and his associates (36).⁴

C. FINDINGS

The children's five mean adjustment scores determined on the basis of the classification of their fathers' occupations described above are listed in Table 1. Analysis of variance was used to test the significance of the difference among the mean scores of the children as classified by their fathers' occupations. For brevity, the analysis of variance calculation tables have been omitted.

⁴For a discussion of the continuum versus discrete social class theory, see Cuber and Kenkel (11, pp. 23-28; and pp. 303-309), see also Hetzler (21) and Lenski (24) for data supporting the statistical theory of social classes.

Mean differences for the personality inferiority scores ($F_{2,183} = 6.54$) and the total scores ($F_{2,183} = 7.21$) were significant, $P < .01$. In each case, there was an inverse ranking of the children's mean scores, in relation to the prestige level of their fathers' occupations. Highest or least adaptive mean scores were made by the children whose fathers were unskilled workers; intermediate mean scores were made by the children whose fathers were semi-skilled or skilled workmen; and the lowest or most adaptive mean scores were made by the children whose fathers were placed in the business or semi-professional category. While the differences were not significant, the same

TABLE 1
CHILDREN'S MEAN ADJUSTMENT SCORES BY THEIR FATHERS' OCCUPATIONS

Occupations of children's fathers	Number	Personal inferiority*	Social maladjustment	Family relations	Day dreaming	Total scores*
Unskilled workers	45	13.62	16.24	9.73	3.29	42.44
Skilled or semi-skilled workers	92	11.29	14.83	9.15	3.66	38.94
Professional and business	49	10.31	14.26	8.61	3.12	36.28
Total	186	11.60	15.02	9.15	3.43	39.09

*For these mean differences, the F ratio was significant, $P < .01$.

ranking pattern was found for two other sets of mean scores and the consistency of these results lends support to the hypothesis being tested.

Another index sometimes used to assign social class position to a family is the educational level of the father of the family. The children's adjustment scores as classified by the educational levels of their fathers are given in Table 2. Higher educational level is assumed to be indicative of higher socioeconomic status.

Only the differences among the total mean scores were significant ($F_{5,250} = 2.47$, $P < .05$) and these scores showed a fairly clear pattern. Children whose fathers attended but had not graduated from high school had the highest mean score, 40.94. Next, with a mean of 38.54 were the children whose fathers were high school graduates and following very closely with a mean of 38.44 were the children whose fathers had an elementary educational level. The children whose fathers were college nongraduates had a mean of 37.08 while the lowest mean, 32.88, was made by the children whose fathers graduated from college. Surprisingly, the children from homes where the father had post graduate training had the second highest mean, 40.31.

With the exception of the children whose fathers were most highly educated, the total mean scores directly supported the hypothesis; data from the personality inferiority and day dreaming subscores indirectly supported the hypothesis. The social maladjustment and family relations mean scores failed to show a pattern of means which could be interpreted as supporting the hypothesis. An unexpected result in this analysis was the reversal in the mean score values for the children whose fathers had some post graduate work. On every score, these children had a higher mean value than the children whose fathers had not completed college or who were college graduates.

TABLE 2
CHILDREN'S MEAN ADJUSTMENT SCORES BY THEIR FATHERS' EDUCATIONAL LEVELS

Fathers' educational levels	Number	Personal inferiority	Social maladjustment	Family relations	Day dreaming	Total scores*
Elementary	92	12.11	14.79	8.84	2.91	38.44
High school non-graduate	32	12.03	15.22	10.09	3.59	40.94
High school graduate	77	11.34	14.70	8.78	3.21	38.54
College nongraduate**	25	10.60	15.12	8.36	2.96	37.08
College graduate	17	8.76	13.12	8.88	2.18	32.88
Post graduate	13	11.31	15.92	9.15	3.92	40.31
Total	256	11.61	14.80	8.95	3.09	38.38

*This was the only set of means for which the F ratio was significant, $P < .05$.

**Includes three fathers who had vocational training beyond high school.

These mean values for these children were also higher than the means for all children except on the personal inferiority score. This finding required the formulation of an alternative hypothesis, but before passing to this point in the discussion section of this paper, the children's adjustment scores as classified by their mothers' educational levels are presented in Table 3.

The mothers' educational levels were defined in the same manner as the fathers' educational levels except that the college graduate and post graduate levels had to be combined for the mothers and a separate category, business and nursing training, appeared for the mothers which was not present for the fathers. Only two wives had post graduate training, and, therefore, could not be treated as a separate group. Eleven of the mothers had business training while four of them were trained nurses.

None of the F values were significant, but there was some tendency for the children's adjustment scores to show an inverse trend with the mothers' educational levels. Examination of the means for the total adjustment scores

showed a picture very similar to that found previously for the analysis using fathers' educational levels. There was a consistent decrease in mean scores with the children of college nongraduate mothers making the lowest mean and with the reversal in the trend of means also present for the children whose mothers were college graduates or had some post graduate training. On the four subscores, the pattern of the mean ranking is less clear. A consistent decrease in scores with increase in mothers' educational level was found for the ranking of the personal inferiority means. In this instance, the reversal for the highest education classification interval was not found.

TABLE 3
CHILDREN'S MEAN ADJUSTMENT SCORES BY THEIR MOTHERS' EDUCATIONAL LEVELS

Mothers' educational levels	Number	Personal inferiority*	Social maladjustment	Family relations	Day dreaming	Total scores
Elementary	47	12.57	15.02	9.32	3.13	40.04
High school nongraduate	56	12.20	15.43	9.21	3.39	39.39
High school graduate	85	11.32	14.38	9.15	3.18	38.02
Business—Nursing	15	10.93	15.47	9.47	3.00	38.87
College nongraduate	40	10.88	14.27	7.35	2.78	35.28
College graduate or beyond	13	10.62	14.85	9.46	2.23	37.15
Total	256	11.61	14.80	8.95	3.09	38.38

*None of the *F* ratios was significant.

For the social maladjustment scores, the variation among means was only slight and exhibited no particular pattern. The striking features about the family relations means is that the children whose mothers had attended but had not completed college had a mean equal to 7.35 while all the other means were higher and very similar, varying from 9.15 to 9.47. Except for the low mean found for the children whose mothers had an elementary education level, the means on the day-dreaming dimension of the adjustment test, in general, showed a pattern similar to that observed for the personal inferiority scores. Examination of the children's means for three of the five scores tended to support the general hypothesis under consideration although the relationship was not as marked as was found for the analysis using fathers' educational levels.

D. DISCUSSION

The general hypothesis which the data reported in this paper were organized to test was: rural and small town children coming from higher

socio-economic status families show fewer indications of personality maladjustment as compared with lower socio-economic children. In general, the personality adjustment data gathered from rural and small town children tended to support the hypothesis.

Significant differences in the predicted direction among the children's total adjustment scores were found for the analysis using fathers' occupations and educational levels as criteria. Personality inferiority means were also significantly different and in the expected direction on the occupational analysis. In eight of the other analyses of children's mean scores where the differences were not significant the ranking of the means was in the direction suggested by the hypothesis. Four of the analyses of the children's mean scores produced nonsignificant differences with no particular pattern of scores.

It is interesting to note that the most support for the hypothesis came from the analysis using fathers' occupations as criteria: two sets of significant differences and three sets of "patterned" means were found. Sociologists generally agree that the occupation of the head of the house is the most reliable index of social status (8, p. 15; 36, pp. 181 ff). Less support was found using the fathers' educational levels: one significant set of differences, two "patterned" sets of means, and two "unpatterned" sets of mean differences were found. Still less support was found using the mothers' educational levels: no significant differences, three "patterned" sets of means, and two "unpatterned" sets of mean differences were found.

Contrasts in the family life of middle and lower social class children supply some possible explanations for the differences in personality characteristics of children from different class levels (1, 15, 18, 26, 27). Studies have found the middle class (which would be the higher socio-economic families referred to in this paper) children are taught conformity as means of achieving status, learn to be independent and better themselves especially by education, and learn to inhibit emotional expression. The middle class child is generally treated kindly by his parents and enjoys at least a semi-democratic home atmosphere. His parents give him as many advantages as they can afford, even at the expense of considerable sacrifice if they think it will help him "get ahead." The child generally feels he is loved and wanted.

Children from lower socio-economic status families are given greater physical and social freedom. This freedom, however, is at the expense of the closer emotional ties which the middle class child experiences with his parents. The lower class child's parents are less concerned with his education. Discipline seems to be less consistent and parental authority is usually exercised in a harsh or authoritarian manner. These generalizations suggest that mid-

dle class children appear to be raised in a more stable, consistent, and psychologically supportive family environment than lower class children and their family experiences are reinforced in the community in which they live. In this connection, Maddy found that professional children who lived in a predominately poorer neighborhood had a lower mean intelligence score than their group while the reverse was true for children from semi-skilled families living in wealthier areas. Children's personality scores, extroversion, and emotional stability tended to resemble less their classification based on their fathers' occupations and resemble more the scores for the group which predominated the neighborhood they were living in (25, pp. 55-56). Furthermore when children enter school they encounter teachers and administrators who represent middle class attitudes and enforce, through the school system, middle class values (1, 12, 22, 34, 35). For these reasons, then, it is not surprising that children from the higher socio-economic families showed better personality adjustment as measured by the Rogers scores.

A portion of the data reported in this paper also suggests some pitfalls for socialization of more economically privileged children. When the children's mean adjustment scores were examined in relation to their fathers' educational achievement, it was found that the children whose fathers had the highest educational achievement, post graduate training, had among the highest or least adjustive personality scores. Most of these fathers could safely be described as having been or as still being in the process of upward social mobility. They may be driven and may be driving their family to achieve a higher status position. For these families, perhaps Green's analysis (15) might be appropriate. Close supervision of the children in order to prevent any behavior which could bring criticism upon the family and higher standards of conformity seem typical of upwardly mobile families. The children are expected to achieve, especially in school and social affairs, not only for their own status achievement but to justify the parents' pride in their progeny and to provide the parents with important vicarious satisfactions. The fathers' drive which took him through graduate school is probably not lost, but abides with him; he wants to be a success in his career. How this affects the emotional tone of the home and his relations with his children is not specifically known, yet the data cited here and elsewhere indicate that the effect apparently is not conducive to healthy personality development for children.

The findings of the present study are based on data gathered from a fairly small sample of children and by means of only one paper and pencil personality test. This investigation was not specifically designed to gather data

to test the hypothesis advanced in this paper, yet a rather clear pattern of results emerged. The need for further research designed specifically to test the relationship between family status and personality development of children seems obvious. Further testing of the social mobility hypothesis appears to be especially intriguing. Review of pertinent literature and the suggestive nature of the findings of this study set in bold relief the comments of another researcher, "it may justifiably be said that the implications of the social status concept for sociology and social psychology have scarcely been realized" (13, p. 402).

E. SUMMARY

The Rogers test of personality development was administered to a sample of 256 children drawn from rural and small town fifth grade schools. A stratified probability sample scheme was used to select an equal number of children from Iowa, Ohio, Kansas, and Wisconsin. Review of the results of previous studies indicated that children from middle class homes tended to show fewer indications of personality maladjustment or difficulty than children from lower class homes. The relationship between socio-economic status and the adjustment characteristics of rural and small town children was tested in this paper by using the occupation of the father and the educational level of both the father and the mother as indices of family socio-economic status.

In general, the analysis of the children's five mean adjustment scores as classified by these parental indices of family status tended to support the hypothesis that higher status children showed fewer indications of maladjustment. While most of the *F* ratios calculated for the mean differences were not significant, the consistent nature of the ranking of the means gave confidence in this summarization.

An unexpected finding in this investigation was that children whose fathers had the highest level of educational achievement, post graduate study, showed greater indications of personality maladjustment than many of the children who came from homes where the fathers were not as well educated. An alternative hypothesis relating to the upward status drive of the father and its consequences for family relations and child socialization was put forth to try to explain this finding.

Findings supporting both the original and the alternate hypothesis were examined in terms of elements of social learning theory applied to the differential social environments experienced by middle and lower class children.

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PARENTAL JUDGMENT OF RESPONSIBILITY IN CHILDREN, AND CHILDREN'S ADJUSTMENT*

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A. INTRODUCTION

An earlier paper has called attention to the fact that measures of responsibility in children, while not associated with specific training experience in home duties, are nevertheless distinctly associated with certain personality characteristics (10). These measures of responsibility include a rating scale filled out by teachers for individual children [the responsibility scale reported by Havighurst and Taba (11), identified in the present paper as *Teachers' Check List*] and a schedule of attitudes known to be associated with a reputation for responsibility in the childhood peer group [adapted from a scale reported by Gough, McCloskey, and Meehl (5), and known in the present paper as *How I Feel About Citizenship*]. On various measures of family adjustment, play activities, interests and attitudes, moral judgment, psychological adjustment, and the like, children rated as responsible by these two measures performed quite differently than did children rated as less responsible.

In yet another study (7) the present author has shown that student teachers describing responsible and least responsible children in their classes tend to select as responsible youngsters those with good work habits and positive social traits, who are conforming, orderly, and mature, who carry through their activities and require little supervision. Least responsible children are identified as not conforming or compliant; they need help with work or "prodding," they are upsetting to the group and appear to the teachers as tense, immature, nervous, irritable, careless, forgetful, aggressive, rebellious, or self-centered. Thus the association of responsibility with desirable adjustment is clearly drawn.

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B. PROCEDURE AND RESULTS

Can parents assess responsibility in their own children in such fashion as to show this association with other personality characteristics? To gather data on this question, approximately 1,800 questionnaires were mailed to a large, representative sample of families whose children participated in the survey already mentioned (10); this sample was approximately 60 per cent of the original population of families. From this group about a two-thirds return was obtained—more than 1,000 questionnaires from parents of children so coded that the parents' opinions could be brought into statistical relationship with the children's data. In the majority of cases the schedules were marked as having been filled out by "mother and father together."

The questionnaire contained 12 items relating to the parents' evaluation of their children's care of their own property and possessions, their practices with money, and their helpfulness about the home. Such items as assuming home chores, doing a good job, working regularly and without need for pressure to complete obligations, being coöperative, showing interest and participating in family affairs, and having a reputation for responsibility, were named specifically. A score on this sub-scale of items, keyed to indicate the parent's judgment of responsibility, was shown by Hoyt's analysis of variance method (12) to be reliable ($r_{tt} = +.90$) for a group of 107 replies. Low and high 15 per cent groups on this scale (exceeding approximately

TABLE 1
NUMBERS OF CHILDREN IN LOW AND HIGH GROUPS ON PARENT-DESIGNATED
RESPONSIBILITY SCORE, BY SEX, RESIDENCE, AND AGE CATEGORIES

	Boys				Girls			
	Town of 8,000 Ages 9-13	of 8,000 Ages 14-17	Rural Ages 9-13	Rural Ages 14-17	Town of 8,000 Ages 9-13	of 8,000 Ages 14-17	Rural Ages 9-13	Rural Ages 14-17
Low responsibility	16	14	24	15	23	13	29	16
High responsibility	16	14	26	12	23	13	29	16

one standard deviation from the mean) were selected at each age. Table 1 gives *N*'s for these groups. When broken down by sex, place of residence, and age, the groups are quite small; however, treated by small sample analysis, significant differences which appear consistently and systematically across certain categories should strengthen the conclusion of a relationship between the dependent and independent variables.

These deviant groups, known as high and low parent-designated responsibility groups, were then compared with respect to mean score on several other

available personality measures,² those reported in reference (10). These other measures can be described briefly. The *My Jobs* schedule consists of a list of home duties or chores answered by the child, and the score indicates the number of tasks which he reports that he does regularly. The *Personality Profile* is an 18-item rating scale of personal and social adjustment filled out by each teacher for each youngster. The *My Family* instrument is a schedule of family attitudes and relationships devised for a study of adolescent character development (11); the score is a count of "favorable" or "desirable" answers. The *Play and Recreation* form consists of a modified form of the Lehman and Witty Play Quiz (13); the score consists of a direct count of number of activities reported. The *Teachers' Index of Adjustment* is a composite arrived at statistically by combining standard scores on the *Personality Profile*, the *Teachers' Check List* and an additional nomination form for well and poorly adjusted children. The *Pupils' Index* consists of a similar unweighted combination of standard scores on the *My Family*, and *How I Feel About Citizenship*, instruments, plus a schedule (unnamed) of items selected from the Pressey Attitudes Scale shown by Durea (2, 3, 4) to differentiate between delinquent and nondelinquent children, and a schedule of psychoneurotic inventory type items (1) (likewise unnamed) which have been shown to be associated with delinquency in children. Both the *Teachers' Index of Adjustment* and the *Pupils' Index of Adjustment* were developed for a large scale study of mental health in children and have been shown to be significantly related to the general adjustment and conduct of the school child.³

Table 2 summarizes the comparisons between high and low parent-designated responsibility groups. The *t* values which reach significance are scattered through the various age and sex groups. Certainly no marked trend toward a pattern of significant differences appears among test scores on personality instruments given the children. This finding contrasts with the significant differences which consistently appear on the other instruments when children are classified as responsible or less responsible by the *Teachers' Check List* or *How I Feel About Citizenship* measures.

Although parental judgments of responsibility did not correlate with independent measures of adjustment, some other items on the parent question-

²These measures were the principal items in a battery of schedules used in the Nobles County Survey, supported by the National Institute of Mental Health research grant (M-690).

³Studies as yet unpublished, John E. Anderson and Dale B. Harris, principal investigators. Reported by John E. Anderson at the meetings of the American Psychological Association, 1952.

naire showed a significant association with parent-designated responsibility (Table 2). Parents of high responsibility children, boys and girls alike, generally report that their youngsters do more jobs around the house and require less persuasion to get the work done, and (for boys) handle money more satisfactorily, and (for girls) get along better with parents in general. Thus some parental attitudes do interrelate to form a frame of reference for evaluating the child. The parent who approves of his child, says he does his work well, and considers him effective in handling money, will undoubtedly refer to him as more responsible. But this frame of reference is quite independent of the larger social frame of reference in peer- and teacher-judgment which also assessed the child.

TABLE 2
SIGNIFICANCE OF DIFFERENCES (*t* VALUES) BETWEEN MEANS OF PARENT-DESIGNATED RESPONSIBILITY GROUPS, BY SEX, RESIDENCE, AND AGE

Measures derived from children's or teachers' schedules	Boys				Girls			
	Town of 8,000 Ages 9-13	Town of 8,000 Ages 14-17	Rural Ages 9-13	Rural Ages 14-17	Town of 8,000 Ages 9-13	Town of 8,000 Ages 14-17	Rural Ages 9-13	Rural Ages 14-17
Score on Teachers' Check List	1.19	1.20	2.11*	3.22*	1.11	1.21	2.39*	1.35
Score on How I Feel About Citizenship	.66	.79	2.24*	.92	.65	.06	.07	.07
Score on What Are My Jobs schedule	.80	.31	1.13	1.63	.09	1.33	2.10*	.46
Rating on Personality Profile	.34	2.54*	.83	2.59*	.29	.85	.02	.17
Total score on My Family Schedule	.27	2.26*	1.85	1.66	1.25	1.87	.56	.25
Teacher Index	.74	2.01	1.22	3.87*	.65	.73	2.73*	1.03
Pupil Index	.49	1.44	2.55*	.89	1.14	1.53	.26	.49
<i>Measures derived from Parents' questionnaire</i>								
Number of Children's Duties Reported by Parents as "Regularly Done"	2.57*	1.21	4.37*	3.24*	2.54*	1.34	5.08*	2.20*
5-Point Rating of "Amount of Pressure Needed to Get Jobs Done"	2.38*	5.22*	.34	1.45	2.08*	2.11*	3.37*	1.81
5-Point Rating of "Child's Wise Use of Money"	3.90*	.12	2.50*	2.45*	.84	.11	1.32	1.36
5-Point Rating of "How Well I Get Along With This Child"	1.95	1.23	1.63	3.16*	3.42*	4.98*	1.66	3.39*

*Satisfies .05 level of significance, or better.

If we accept the findings of other studies (6, 7) which show that responsibility is closely tied up with general adjustment, we are faced with several possibilities: (a) Our criterion schedules of responsibility are invalid. This possibility we discount because the items for the parental criterion measure were selected from common parental expressions of what constitutes responsibility in children and were answered consistently by the respondents. Likewise, other evidence (6, 9) suggests that the *Teachers' Schedule* and the *Pupil Inventory* do, in fact, possess considerable validity as indices of responsible attitudes and behavior. (b) Behaviors which parents denote as responsible may be quite independent of the behaviors which denote adjustment or responsible behavior in children, as judged by teachers and psychological tests. There may be some truth in such an interpretation. Parents see children in selected, recurring circumstances, and often have little basis for comparing them with other children. Teachers commonly have the advantage of wider experience with individual differences in a particular age group and thus have a more systematic reference "norm." (c) Parents' analysis of child responsibility may reflect their own effectiveness in relating to children. Those who get along successfully with children tend to be pleased by their children's behavior, overlook minor errors, and regard favorably such evidences of responsible behavior as they see. Those who do not get along with children may develop rather generally critical attitudes and fail to see, or are dissatisfied with, such responsible behavior as children may exhibit. The reactive effect of such reinforcement (or lack of it) on parental success with children in the complex system of parent-child relationships is obvious. Concerning this system of relationships parents cannot be as objective as the "outside" observer.

C. SUMMARY

A scale of 12 items designating the parents' view of child responsibility was included in a questionnaire on child rearing attitudes and methods. Parents recorded responses with respect to particular children on whom data from several personality and adjustment schedules were available. Children evaluated by their own parents as high in responsibility were contrasted with those rated as low in responsibility on these several measures. Few significant differences appeared, and these were scattered unsystematically through several age and residence groups. Nor were there significant differences on two measures of responsibility previously reported (9), or on household duties reported by children. On the other hand, parental judgment of child responsibility was consistent with the parents' report of children's assumption of duties, ease in getting children to complete their tasks, wise use of money

(especially by boys), and getting along well with children (especially in girls). These findings were contrasted with the positive association noted between adjustment and personality measures on the one hand, and on attitude test and teachers' rating criterion of responsibility on the other (7). An interpretation was offered that parents are not in the best position to make judgments about responsibility which reflect the child's impress on his larger social world. Their judgments become confounded with their own successes and failures in the intimate relationships of discipline, guidance, and affection which constitute the parental rôle.

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MATERNAL ATTITUDES TOWARD CHILD BEHAVIOR AND THEIR RELATIONSHIP TO THE DIAGNOSTIC CATEGORY OF THE CHILD*

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A. PROBLEM

This was a descriptive study designed to examine specific characteristics of maternal attitudes toward child behavior, and to explore their relationship to the type of adjustment made by the child.

The population studied was comprised of two groups: 66 disturbed children and their mothers, seen consecutively during one year at the Queens College Educational Clinic, Flushing, N. Y.; 18 non-disturbed children and their mothers, seen over a three-year period at the same clinic, for purposes of another study.

Race, religion, age of parents, and socio-economic status were not factors in deciding eligibility of the children for clinic service. The clinic policy does restrict services to residents of New York State who are attending nursery, elementary, or high schools.

In the group of 18 children making a normal adjustment the ages ranged from 6 to 12, inclusive. All were boys.

In the group of 66 disturbed children seen during the one-year study, the ages ranged from 5 to 17. There were two five-year-olds, 46 between the ages of 6 and 12, inclusive, and 18 between 13 and 17, inclusive. There were 56 boys and 10 girls.

The hypotheses to be tested were that: (a) mothers whose children are diagnosed as suffering from an emotional disorder will show a higher incidence of restrictive and lax and overindulgent attitudes than the mothers of children who are diagnosed as making a normal adjustment; (b) mothers of children diagnosed as neurotic will reveal a higher incidence of restrictive attitudes than mothers whose children are otherwise classified; (c) mothers whose children are diagnosed in the category of primary behavior disorder

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will show a higher incidence of lax and overindulgent attitudes than the mothers of children otherwise classified.

B. METHOD

Maternal attitudes were categorized on the basis of scores obtained on an opinion survey as well as on the basis of an intake interview. Classifications were restrictive, lax and overindulgent, moderate, and inconsistent.

This attitude survey was constructed along lines suggested by E. J. Shoben's work on parental attitudes (14). It contains 80 items pertaining to child rearing, to which subjects may indicate agreement, disagreement, or uncertainty. The items refer to behavior at home, in the school, and in the neighborhood. They are worded in the form of stereotypes, such as "Parents should never be impatient with their children."

The items were tried out on a group of sophisticated judges. Each judge checked each item as he thought a mother with restrictive attitudes would check it, as a mother with lax and overindulgent attitudes would check it, and as a mother with moderate attitudes would check it. Only those on which consensus was obtained were retained. For example, if all six judges indicated that a restrictive mother would agree with an item, and that a moderate or indulgent one would not, the item was conceived of as a restrictive item, i.e., one that only a restrictive mother would agree with. The limits for scoring were determined from a group of mothers whose attitudes had already been estimated by other means.

In this pilot group there were 27 moderate mothers, three restrictive mothers, three lax and overindulgent mothers, and four inconsistent who responded to the scale.

The restrictive mean for the moderate group was 5.15, standard deviation 1.43. The lax and overindulgent mean was 3.19, standard deviation 1.31.

Thus in a normal distribution of moderate mothers the upper limit for approximately 99.8 per cent of the population for restrictive scores would be 8.44, for lax and overindulgent scores 7.12. Reexamination of the scores of the pilot group showed that all the restrictive scores of known restrictive mothers were well above the limit of 8.44, and all the lax and overindulgent scores of known lax and overindulgent mothers were well above the limit of 7.12. Mothers known as inconsistent had both restrictive and lax and overindulgent scores well above the established limits.

The children were categorized on the basis of a complete clinic study, using those tests and devices which are commonly used for this purpose in

child guidance clinics. Classifications were primary behavior disorder, neurosis, simple maladjustment, normal adjustment.

The Chi-square method was used to test for a statistically significant general relationship between the mothers' and children's classifications. Critical ratios were obtained in a search for special relationships. Case histories were examined for additional qualitative factors which should be considered in interpreting the data and arriving at conclusions.

C. RELATED STUDIES

The influence of parental attitudes on a child's adjustment is widely accepted.

Witmer (17) has stated that parental attitudes affect clinical treatment of children and success depends largely on the home climate. Alexander (1, p. 97) noted that the emotional difficulties of children were determined chiefly by parental attitudes. In her discussion of the growth of clinically oriented casework, Hamilton (8, p. 9) reported that indulgent, inconsistent, or repressive parental attitudes toward children seemed equally thwarting to full personality growth. English and Pearson (5, pp. 23, 90, 151, 152) have stressed the importance of adverse parental attitudes in the development of unhealthy reaction patterns in the child. Kanner (10, p. 118) emphasized the value of helping parents to modify their attitudes.

With awareness of the significance of attitudes in studying human behavior, attempts have been made in various areas to measure and evaluate them.

Thurstone (16) was a pioneer in this field, although he was interested mainly in measuring attitudes toward a specific entity, and used the method of equal-appearing intervals to do so.

Remmers (13) describes a modification of Thurstone's technique, to measure more attitudes with no increase in labor.

Field (6) used the case history to evaluate attitudes, stating that certain aspects in the case history were indicative of the maternal attitudes held.

A carefully detailed methodology for the appraisal of a child's home environment was devised and tested by the S. S. Fels Research Institute for the Study of Human Development. The Fels Parent Behavior Rating Scales were first devised by Dr. Horace Champney in 1937, and in 1949 an integrated description of the scales was published (2).

Researchers continued to try out various more economical methods of evaluating parent-child relationships.

Shoben (14) concluded that: (a) parent behavior as represented by parent attitudes is measurably consistent; (b) parental attitudes are meaningfully

associated with child adjustment; (*c*) relevant and internally consistent variables can be extracted from a pool of items by sophisticated judges; and (*d*) the U. S. C. Parent Attitude Survey is of sizeable potential value in the study of the effect of parent attitudes on child adjustment.

Taking his cue from Shoben's work, Mark (12) used a similar survey to evaluate the attitudes of mothers of male schizophrenics.

Studies by Clardy (3), Despert (4), Kasanin (11), and others too numerous to list have revealed marked tendencies in the mothers of schizophrenics toward infantilizing the offspring with serious overprotection and maintenance of dependency.

Freeman and Grayson (7) used the attitude survey validated and reported by Shoben (14) to find if it significantly differentiated the mothers of their schizophrenic patients from the mothers of a nonschizophrenic control group. The study revealed that the mothers of schizophrenics were characterized by more possessive and ignoring attitudes than the other mothers, but failed to reveal significant differences between the two groups in respect to dominating attitudes.

Symonds (15) found suggested correlations between parental tendencies to reject or overprotect, and the behavioral trends of the children. Hatwick and Stowell (9), in a study of children in kindergarten and the first six grades of school, concluded that children's school work is related to home influences such as overprotection and high standards.

The literature and studies mentioned here suggest that: (*a*) child adjustment and parental standards and behavior are related; (*b*) overindulgence, severity, submissiveness, and dominance of parents affect children's adjustment; and (*c*) emotional security at home is an important factor in the satisfactory adjustment of the child.

D. RESULTS

The hypothesis that mothers whose children are diagnosed as suffering from an emotional disorder would show a higher incidence of restrictive and lax and overindulgent attitudes than the mothers of children who have been diagnosed as making a normal adjustment was upheld by a comparison of proportions in the two groups. Among the 66 mothers of disturbed children 74 per cent revealed attitudes that were restrictive, lax and overindulgent or both (inconsistent), while only 26 per cent revealed moderately permissive attitudes. Among the 18 mothers of non-disturbed children, 100 per cent revealed moderately permissive attitudes.

The hypothesis that the mothers of children diagnosed as neurotic would

reveal a higher incidence of restrictive attitudes than mothers whose children are otherwise classified was not statistically supported by a *t*-ratio comparison of proportions.

The hypothesis that mothers whose children are diagnosed in the category of primary behavior disorder would show a higher incidence of lax and over-indulgent attitudes than the mothers of children otherwise classified was not statistically supported by a *t*-ratio comparison of proportions.

The inference from the statistical data is that non-disturbed children tend strongly to have mothers whose attitudes are moderately permissive while disturbed children tend strongly to have mothers whose attitudes are not. It may be concluded from this that moderately permissive attitudes are associated with normal adjustment in the child, but the nature of the association cannot be specified.

The statistical data also reveal that the mothers of children classified in the combined categories of neurosis and simple maladjustment have attitudes that are restrictive, moderate, or inconsistent.

Thus we cannot conclude that there is any relationship between a particular kind of maternal attitude and a specific emotional disorder in the child.

A question which arises here is whether the present clinical diagnostic categories of children's emotional disorders are clear-cut enough for relationships between maternal attitudes and children's diagnostic categories to reveal themselves.

It is accepted by clinicians that differential diagnosis is most difficult to obtain. For example, there are many children with neurotic symptoms who also act out their conflicts. It is also true that children are in a state of growing and developing, and might later move into a more clearly defined diagnostic category. For example, a child classified under simple maladjustment might later develop neurotic symptoms and be classified as neurotic. Present diagnostic categories cannot take into account the direction of growth.

Perusal of the case histories and content of attitude responses suggested other considerations to be kept in mind in interpreting the data and formulating suggestions for further study:

(a). The degree of restrictiveness or overindulgence and areas of child behavior in which the mother's attitudes are restrictive or lax and overindulgent may vary from person to person.

(b). Attitudes at any given time may not be the same as they have been in the past.

(c). The mother's attitudes may not be clearly enough defined to permit accurate evaluation.

(d). Inconsistent attitudes may reveal themselves in content of items rather than in scores.

(e). The degree of restrictiveness as felt by the child may vary from the degree to which the mother is evaluated as restrictive.

The second of the foregoing considerations is extremely important in any attempt to relate specific maternal attitudes to children's diagnostic categories.

It cannot be assumed that the assessment of a mother's attitudes at any given point in time would be an adequate measure of her attitudes at critical developmental periods in the child's life.

E. SUMMARY

The question explored was the relationships between maternal attitudes and children's diagnostic categories. The mothers were classified as restrictive, lax and overindulgent, moderate or inconsistent, on the basis of an attitude survey and case histories. The children's categories were neurosis, simple maladjustment, primary behavior disorder, and normal adjustment, as determined by clinical tests and measurements widely used in child guidance clinics.

The mothers of disturbed children showed a higher incidence of restrictive and lax and overindulgent attitudes than the mothers of children who were making a normal adjustment.

The mothers of neurotic children did not reveal a higher incidence of restrictive attitudes than the mothers of disturbed children otherwise classified.

The mothers of children with primary behavior-disorder did not reveal a higher incidence of lax and overindulgent attitudes than the mothers of disturbed children otherwise classified.

The study suggested two major problems to be considered in the use of attitude surveys for exploring relationships between parental attitudes and child adjustment.

1. Attitudes do not necessarily remain stable over a period of time, and consideration must be given to determining the attitudes to which the child was exposed during important developmental phases of his life. Intensity of attitudes and the area of child behavior in which they are expressed, must be considered in addition to classification.

2. The transient nature of the child's adjustment and the problem of overlapping in the various diagnostic categories in diagnosis of children's emotional disorders may affect the findings.

Therefore suggestions for further study involve further refinement of attitude surveys to take into account the degree to which the respondent is

restrictive or otherwise, the kind of attitudes to which the child was exposed during important periods in his past life; further refinement of methods of classifying children's emotional disorders to decrease overlapping.

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ADRENAL CHANGES PARALLELING SHORT-RANGE BEHAVIORAL EFFECTS OF ELECTROSHOCK*

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A. INTRODUCTION

Behavioral effects of electroconvulsive shock (*ECS*) have in some instances been studied as a function of number of stimulations. In analyzing the influence of *ECS* on maze learning in rats, McGinnies (10) reported an increase in running time after the initial convulsion, and Hayes (6) noted a tendency, developing during the first few trials, for his shocked animals not to reach the goal box on some runs. Duncan (5), studying the time interval between conditioned avoidance trials and *ECS*, obtained performance curves which for the 20- and 40-sec. groups appeared to show decrements after approximately 7-9 and 10-12 trials. An investigation by Brown and Fosmire (3) found that in the simultaneous learning of two maze habits, rats receiving 22 shocks were as much impaired as those receiving a total of 40. With the same type of learning situation, Brown and Wilbanks (4) obtained evidence suggesting that ability to recover function after *ECS* depends on the number of treatments received.

In the realm of emotional response, Masserman and Jacques (9) offered evidence that *ECS* had a depressant or disintegrative effect on experimental neurosis in cats, which seemed to vary with the number of shocks in a series of 10. Likewise, Brady, Stebbins, and Hunt (2) have shown that the attenuation of a conditioned emotional response in the rat is a function of the number of *ECS* treatments. In the work of Stone (14) there is the interesting suggestion, difficult at present to reconcile with the two previous findings, that "pseudoshock" handling decreased the wildness of feral rats. Stone's corresponding group receiving *ECS* did not show this increased taming during the period of 25 daily shocks, nor during a post shock period of approximately three weeks.

In view of these findings which point to functional relationships between amount of *ECS* and behavioral change, it appears desirable to look for physiological correlates of such modification. Many measures have shown that *ECS* produces changes characteristic of systemic stress. Among these are

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the observations of Rosvold and associates (11, 12) demonstrating adrenal hypertrophy following such treatment. The present research was designed as a systematic investigation of possible adrenal hypertrophy after different frequencies of *ECS*. The frequencies selected represented points that seemed of critical importance in the behavioral literature.

B. METHOD

Female albino rats were used throughout. In order to check on the possibility that the estrus cycle could produce major interaction with other adrenal effects, a preliminary study was conducted. Twenty animals from the same large living cage were used, matched for mean body weight. Ten were in full estrus and 10 in diestrus, as determined by vaginal smears. Adrenals were removed and weighed within 90 min. of establishing estrus cycle phase.

In the main series, 80 animals, not previously used in experimentation, were assigned at random to the following groups, with *Ns* as indicated:

1. 4 days of *ECS*, 1 trial/day (10)
2. 4 days of *ECS*, 5 trials/day (14)
3. 4 day-control (10)
4. 10 days of *ECS*, 1 trial/day (11)
5. 20 days of *ECS*, 1 trial/day (11)
6. 30 days of *ECS*, 1 trial/day (14)
7. 30-day control (10)

More animals were assigned to those groups where there was greater expectation of experimental loss. Animals were weighed on the day prior to the beginning of treatment and again at the time of tissue removal. Drinking water and Purina Laboratory Chow pellets were available in living cages at all times. Groups 1-3 were run on the same days, and immediately following, Groups 4-7 were started simultaneously. Treatment days were consecutive. In Group 2, the trials on any one day were separated by at least 1 hr., and not more than 3 hrs.

A 0.2-sec. pulse of 85 V., 60 c.p.s. was used to produce *ECS*. This was applied to the ears through alligator clips wrapped with gauze and moistened with an aqueous solution of 5 per cent sodium bicarbonate. Timing was effected by a Hunter interval timer with quiet relays. The above current produced a grand mal seizure in all but five of the 970 individual trials run. In these five cases a second shock of approximately 110 V. was immediately applied, and convulsions obtained. After attachment of ear clips, animals were lowered into a cardboard box, and current applied through a mercury

switch. Control animals had ear clips attached daily, and were lowered into the box for approximately the same time as elapsed prior to convulsion in experimental groups.

Following an interval of $25\frac{1}{2}$ - $26\frac{1}{2}$ hrs. after the last ECS or control treatment, animals were sacrificed with chloroform, and adrenals removed for immediate weighing. When more than one group finished on the same day, tissues were removed alternately from members of the different groups.

C. RESULTS

1. *Estrus Cycle and Adrenal Weight*

The rats in estrus and diestrus had adrenals of very comparable weight, with means of 24.8 and 26.4 mg., and standard deviations of 4.0 and 3.2 respectively. That the above figures do not confound and blend effects of estrus and total body weight is suggested by the fact that the body weight means were 140.8 and 139.7 g. respectively.

2. *Changes in Body Weight*

The 4-day and 30-day experimental groups, having directly comparable controls, can be studied for body weight gain. The two 4-day experimental groups showed significant depression of body weight gain, while the numerically greater body weight increase of 30-day experimentals was not significant (Table 1).

3. *Effect of Five ECS per Day on Adrenal Weight*

In view of the differential body weight gains in the 4-day groups, especially in animals receiving five ECS per day, relative adrenal weights in Table 2 have been expressed in terms of initial body weights. Adrenals of the 20-ECS group were significantly enlarged in relation to the controls, but not in relation to the 4-ECS animals.

4. *Effect of Varying Periods of Daily ECS on Adrenal Weight*

Figure 1 plots adrenal hypertrophy following the different series of single daily shocks. In this type of comparison it is necessary to base adrenal ratio on final body weight, since initial body weight yields artificially high ratios for long treatment periods (e.g., 20 and 30 days) when treatment durations are unequal. Although previous research has amply shown that ECS influences body weight, use of the above ratio has meaning, in the sense that available

evidence suggests it provides an indirect reflection of cortical steroid output per gram of body tissues. This ratio has somewhat different implications from the one based on initial body weight—implications which will undergo progressive clarification as more becomes known concerning constituents involved in the body weight changes, cortical steroid utilization by different tissues, and changes in output of various corticoids during adrenal hypertrophy.

TABLE 1
CHANGES IN BODY WEIGHT UNDER DIFFERENT ECS SCHEDULES

Group	N	Mean initial body wt. (g.)	Mean wt. gain final-initial (g.)	SD Wt. gain	t (E - C)
4-day control	10	129.2	7.4	4.1	
4 days, 1/day	10	126.3	2.8	4.1	2.24*
4 days, 5/day	14	131.8	-7.0***	5.2	6.70**
30-day control	9	133.0	37.3	21.0	
30 days, 1/day	13	120.8	52.3	13.3	1.96

* $p < .05$.

** $p < .001$.

***Different from 4 days, 1/day group, with $p < .001$.

TABLE 2
EFFECTS OF TWO 4-DAY SCHEDULES OF ECS ON ADRENAL WEIGHT

	N	Adrenal wt. (mg/100 g. initial body wt.)	
		Mean	SD
Control	10	34.0	3.0
4 days, 1/day	10	36.9	5.1
4 days, 5/day	14	38.3*	4.5

*Different from control at .02 level.

Since relative adrenal weights were almost identical for the 4-day and 30-day control groups (32.1 mg. and 31.6 mg.) the two were combined into an over-all control for the purposes of Figure 1. The points on the graph significantly different from the control value, and the levels of significance, are 4-day (.05), 10-day (.01), 30-day (.05). The significance of hypertrophy for the 30-day group was further checked by using only 30-day controls and relating adrenal weight to initial body weight. This comparison was consistent in showing hypertrophy, significant at the .02 level. In all, six animals were lost to the study—one was eliminated for extreme nervousness, four did not survive treatment, and one was not used because of abdominal adhesions at autopsy.

D. DISCUSSION

The control experiment on adrenal weight and estrus cycle served to decrease the likelihood that differences in the two estrus phases studied would have a major effect on the precision of adrenal weight comparisons. How-

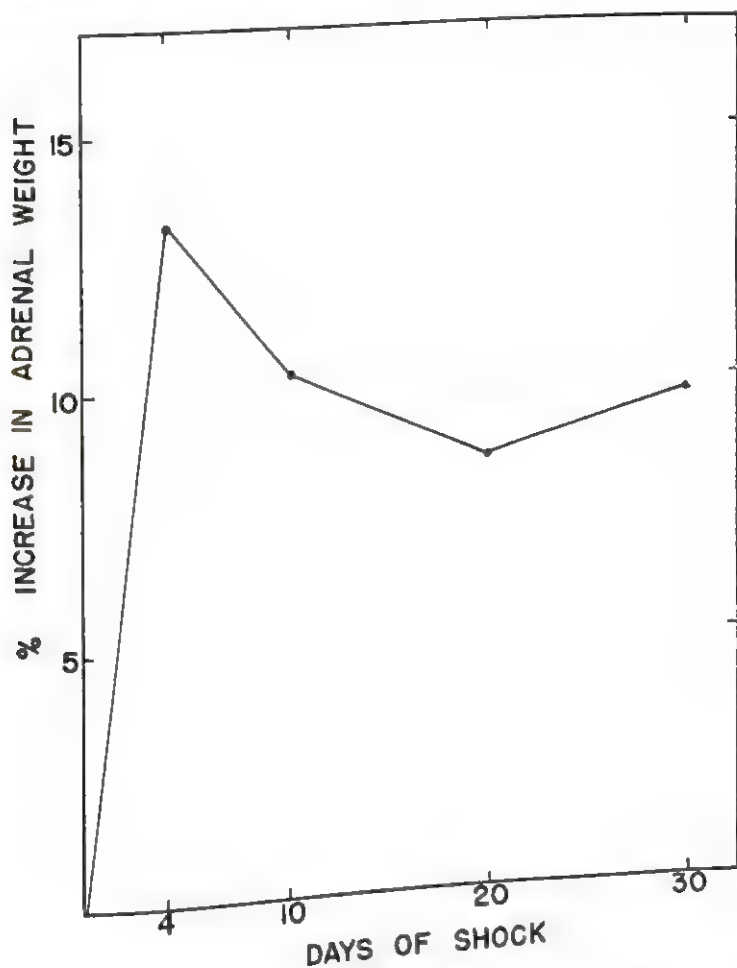


FIGURE 1

RELATIONSHIP BETWEEN NUMBER OF ELECTROCONVULSIVE SHOCKS AND ADRENAL WEIGHT

ever, since Jensen and Stainbrook (7) have demonstrated that *ECS* can produce lengthened periods of diestrus, and Schwartz and Shirky (13) have found that proestrus is associated with increased adrenal weight, there remains a possibility of interaction of ovarian with more general systemic *ECS*

effects in producing adrenal modification in the female rat. It could be hypothesized that such interaction would depress rather than heighten adrenal weight increase in experimentals in the present research, but available data are not complete enough for safe generalization.

The weight changes reported are consistent with weight loss early in an *ECS* series, frequently noted by other investigators. The more unique aspect of the present findings regarding body weight is the demonstration of the very rapid and large weight change which may be produced by concentrated treatment.

Observations of the behavior of experimental animals during the longer series of *ECS* suggested, at about one week after the start of treatment, that they were more active during the day, and sooner after shock. The general impression was one of some regaining of normal equilibrium which had been distributed by onset of *ECS*. Elements of such change might, with more refined observations, be demonstrated earlier in treatment.

The numbers of *ECS* applications in the different groups of the present work parallel numbers of treatments often previously used in research and therapy, although the present temporal distribution of shocks is more concentrated than that sometimes employed. Caution must be exercised, however, in comparing the present adrenal findings with behavioral changes presumably taking place over the same period of time. It is, nevertheless, interesting to relate the rather rapid hypertrophy and then approximate leveling off at the point reached by the 4-day group, to other results. Ashby's (1) assays of cortical steroids during electroshock therapy indicated that there was an abrupt rise in output of some corticoids a few days after the beginning of treatment. The large majority of these peaks (86 per cent of the instances) came within seven days following the first convulsion of the series. Another interesting parallel is found in the time and error curves for Hayes' (6) maze learning results with daily *ECS*. These graphs start to show separation of experimental and control groups around Days 3-4 and 5-6 respectively. Duncan, using daily *ECS*, found somewhat later learning performance shifts, as noted above. In the report by Brown and Fosmire (3), cited previously, a graph of the performance of animals receiving *ECS* from the 14th day on, shows a striking deterioration of performance five days after the beginning of the shocks. The trend of the present results also calls to mind the dramatic change in affective disorders frequently reported to follow four or five shock treatments (8).

In interpreting the present data, the leveling of adrenal hypertrophy at about four days cannot be considered independent of treatment distribution

and duration. However, the absence of additional progressive adrenal changes through the 10-30 shock groups might be considered surprising in view of frequent reports that such shock totals may be required to produce behavioral modification (8). Although possible modes of interaction cannot safely be suggested by these data, the temporal parallel between adrenal change and known short range behavioral alterations seems to suggest another focal point for analysis of *ECS* mechanisms.

E. SUMMARY

Adrenal weight changes were studied for 80 female albino rats assigned to conditions involving different numbers of electrically induced convulsions. Behavioral observations suggested that at about seven days experimental animals were regaining a normal activity pattern that had been disturbed by the onset of the shock series. Four consecutive days with one electroconvulsive shock per day produced an increase in relative adrenal weight. Groups receiving 10, 20, and 30 days of the same treatment did not show significantly more hypertrophy than the 4-day group. The rapid occurrence of adrenal hypertrophy over a few stimulations parallels several known behavioral effects.

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AUDIOGENIC SEIZURES IN RATS AFTER GONADECTOMY AND DURING SUBSEQUENT REPLACEMENT THERAPY*

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A. INTRODUCTION

In a recent paper, Bevan and Chinn (1) reported a preliminary study of sound-induced seizures in rats after castration and after treatment with testosterone propionate. The aim of their experiment was two-fold: to provide data that might help explain reported sex differences in susceptibility and to examine apparent inconsistencies in reported effects of endocrine therapy. [The literature is summarized in Bevan and Chinn (1).] Their results were consistently negative: no suggestion of a difference between control and experimental animals, after castration or after subsequent replacement therapy, was demonstrated in frequency and intensity of convulsive response, in latency of the first running attack and epileptoid phase, in duration of running prior to convulsion, in mean number of running attacks prior to convulsion, and in the ratio of running time to total time prior to convulsion. Meanwhile, several methodological considerations preclude drawing a generalized conclusion from the results. First, only male animals were used and these were castrated post-pubertally, hence there is no guarantee that the surgical treatment significantly reduced the supply of male hormone. Secondly, the dose used in replacement therapy was markedly in excess of the physiological dose and no experimental consideration was given to the possible rôle of estrogenic compounds. Finally, although Fuller, Easler, and Smith (2) present evidence to suggest that sex differences in susceptibility in mice have a genetic basis, no between-strains comparisons were made.

The present study was designed to assess possible sex differences in susceptibility with each of the above variables, except strain, more appropriately provided for. Stock originating from a strain commonly used in rat experiments was used and both male and female animals were tested. Among the gonadectomized animals, half got androgen and half estrogen therapy to check the possible effects of changes in androgen-estrogen balance.

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B. SUBJECTS AND APPARATUS

Ninety albino rats, 45 males and 45 females, 60 days of age at first test were used as subjects. All were drawn from a strain inbred from Wistar stock for about 20 years at Emory University.

The test chamber was the same as that used in the earlier study. It consisted of a small metal tub mounted in a cork-lined wooden box with a hinged window at top. Auditory stimulation (mean intensity: 101 db, range 99-104 db) was provided by a 4-inch doorbell mounted at the top center of the chamber. Stimulus duration was controlled by a GE T-48 interval timer.

C. PROCEDURE

1. *Test Sequence*

All animals were weaned at 22 days of age. The male subjects were randomly divided into three groups of 15 animals each. The females were similarly treated. Two groups of males were subjected to bilateral orchidectomy, two groups of females submitted to bilateral ovariectomy, and one group of each sex were maintained as controls. The gonadectomies were performed when the animals were between 30 and 40 days old. The first test sequence (Sequence I) was begun when the animals were 60 days of age. It consisted of 10 seizure tests, one test every second day for 20 days. Each test consisted of a two-minute exposure to sound.

After Sequence I, the animals were rested for 14 days. On the first day of this rest period hormone therapy was begun. One group of operated males and one group of operated females were placed on a testosterone regimen. This consisted of 1 mg. per week of Upjohn Depo-Testosterone Cyclopentylpropionate in oil administered intramuscularly. The remaining two groups of operates were placed on estradiol therapy. Each animal received 10 micrograms every 25 days of Upjohn Estradiol Cyclopentylpropionate in oil administered intramuscularly. Injections were continued until Sequence II was completed and animals were sacrificed.

On the 15th day after Sequence I, Sequence II was begun. It, like Sequence I, consisted of 10 tests on alternate days. At the completion of Sequence II, the animals were sacrificed and weights of seminal vesicles and adrenal glands obtained for 10 randomly selected animals in each group.

2. *Test Procedure*

This was identical with that of the earlier study. A check list was kept of the symptoms displayed in preconvulsion, convulsion, and post convulsion response periods. Latencies and durations of the running attacks and

the epileptoid sequence were recorded. At the end of each test the subject's response was rated either No Response (*N*), Running Attack (*R*), or Full Convulsion (*C*). From these ratings were devised frequency or *F*-scores and intensity or *I*-scores in a manner described in the earlier paper. These scores along with the latencies of first running attack were subjected to double-classification variance analysis with treatments as columns, sex as rows, and individual scores as within cells sources of variance. In the case of trials in which the response was *N*, the latency was arbitrarily given a value of 120 seconds.

D. RESULTS

1. Sequence I: The Effect of Gonadectomy on Seizure Sensitivity

The upper half of Table 1 summarizes for Sequence I behavioral measures which we have found to be discriminating indices of sensitivity in earlier studies. While there is some suggestion in the group totals of *N*, *R*, and *C*

TABLE 1
TOTALS OF *N*, *R*, AND *C* REACTIONS, MEAN *F*-SCORE, MEAN *I*-SCORE, AND MEAN LATENCY OF FIRST RUNNING ATTACK IN SECONDS FOR EACH GROUP DURING EACH SEQUENCE

Sequence	Sex	Treatment	<i>N</i>	<i>R</i>	<i>C</i>	<i>F</i> -Score	<i>I</i> -Score	Latency of 1st run. att. in sec.
I	Male	Control	111	37	2	.25	.37	97
		Castrate	97	35	13	.35	.49	90
		Castrate	92	48	10	.39	.50	89
I	Female	Control	83	57	10	.48	.45	83
		Ovariectomy	90	45	15	.40	.54	86
		Ovariectomy	99	30	21	.34	.44	89
II	Male	Control	116	28	6	.23	.32	99
		Testosterone	84	57	9	.44	.40	79
		Estradiol	96	47	7	.36	.37	107
II	Female	Control	65	55	30	.65	.64	60
		Testosterone	97	37	16	.35	.44	86
		Estradiol	96	42	12	.36	.38	84

reactions that the unoperated males may be less sensitive and the unoperated females more sensitive than the operated groups, this is not borne out when the *N*, *R*, and *C* counts for individual animals are transformed into *F*- and *I*-scores and these, along with the latency data, are statistically analyzed. For Sequence I there is no reliable difference between sexes, irrespective of treatment, on any of the indices of susceptibility (the largest *F* ratio with $df = 1/84$ is 1.08); or between operates and non-operates, irrespective of sex (the largest *F* ratio with $df = 2/84$ is 1.08). Nor is there a significant interaction between sex and treatment which would set any single group or

groups off from the others in sensitivity (the largest F ratio with $df = 2/84$ is 1.13). Thus, the conclusion of the first study, that castration in this strain has no effect upon sensitivity, would appear to be confirmed. In addition, ovariectomy in this strain is similarly ineffective in influencing female sensitivity. Finally, there is no evidence of a sex difference among the unoperated animals tested. Thus it would appear that any statement claiming a sex difference would have to be qualified by identifying it with some special characteristic (presumably strain) of the animals in which it was observed. Generally speaking, however, the claims of sex difference have been inconsistent and based on small samples of data. While final answer will depend upon cross-species comparisons, we suspect that more thorough within-species sex comparisons on a number of species will indicate the early reports to be the result of sampling error.

2. *Sequence II: Sensitivity After Replacement Therapy*

The lower half of Table 1 presents the several indices of sensitivity for Sequence II. Again, there is no evidence from any index of a general difference in sensitivity between the two sexes (the largest F ratio with $df = 1/84$ is 3.88), nor any indication that the experimental treatment has influenced responsiveness (the largest F ratio with $df = 2/84$ is .84). Meanwhile, a significant sex-by-treatments interaction in frequency appeared ($F = 3.98$; $df = 2/84$; $P < .05$). This would seem to be due to a straggling low mean F -score for the operated, untreated males and a straggling high mean F -score for the unoperated females. But the untreated males show no change in F -score over Sequence I. Hence the significant interaction must be due to an increased frequency of reaction in the control females. Since a number of studies indicate age to be an important variable in sensitivity, one is tempted to interpret this as a sex-by-age interaction, not related to gonadal activity, the males showing no change as they get older, but the females reacting more frequently with advancing age. This is not valid, however, for there is no general sex difference for Sequence II. Further, the other two indices of sensitivity do not display significant interactions. We are thus inclined to write this one significant F -ratio off as a reflection of sampling error, and to reaffirm the conclusion drawn in the first study that gonadal hormones (at least in the strain tested) have no relation to susceptibility.

3. *Physiological Consequences of Gonadectomy and Replacement Therapy*

Table 2 presents mean weights of seminal vesicles, uterus, and adrenal glands. In the case of the males, 1 mg. of Depotestosterone Cyclopentyl-

propionate per week was adequate for the maintenance of normal organ weight, for there is no difference in seminal vesicle weights of normal and operated testosterone-treated males ($t = .22$; $df = 18$; $P > .05$), and this is quite in contrast to the weight of the castrate males given estradiol ($t = 10.77$; $df = 18$; $P < .001$). In the case of the females the dose of 10 micrograms of Estradiol Cyclopentylpropionate every 25 days was inadequate to maintain normal uterine weight ($t = 6.50$; $df = 18$; $P < .001$) although it kept organ weight above that of operated females on testosterone ($t = 5.31$; $df = 18$; $P < .001$).

TABLE 2
MEAN WEIGHTS OF UTERUS, SEMINAL VESICLES, AND ADRENAL GLANDS FOR THE
SEVERAL GROUPS IN MILLIGRAMS ($N = 10$ PER GROUP)

Sex	Treatment	Seminal vesicle or uterine weight	Weight of adrenals
Male	Control	382	36
	Testosterone	390	39
	Estradiol	51	72
Female	Control	548	62
	Testosterone	160	43
	Estradiol	277	82

The adrenal-gland weights of animals from all groups were subjected to a double-classification analysis of variance. This revealed that, regardless of treatment, the adrenals of the females were about 13 grams heavier than those of the males ($F = 15.27$; $df = 1/54$; $P < .001$). Further, in both males and females estradiol produced hypertrophy of the adrenal glands, the average almost double that of the control groups and those given testosterone ($F = 10.76$; $df = 2/54$; $P < .001$). This is particularly striking since the amount of estradiol given was inadequate to maintain normal uterine weight; it is, however, consistent with what might be expected from estrogenic stimulation of the anterior pituitary (3). The interactive relationship between sex and hormone therapy was revealed by a final significant F -ratio ($F = 3.70$; $df = 2/54$; $P < .05$).

E. SUMMARY

Ninety young rats, 45 males and 45 females, of the same strain and age were divided into six equal-sized groups, three all male and three all female. Two groups of each sex were prepuberally gonadectomized. Beginning at 60 days of age they were given a series of tests to determine susceptibility to audiogenic convulsion. No evidence of a difference in susceptibility

attributable to either sex or operative treatment was apparent. One group of each sex was placed on a regimen of testosterone therapy, the other on estrogen therapy. A second series of tests was then conducted. This again revealed no clear indication of a sex difference or a change in responsiveness produced by the hormone treatment. It is therefore concluded that, at least, in the strain studied, there is no sex difference in susceptibility, nor do sex hormones influence the occurrence of convulsions.

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CHANGES IN ETHNOCENTRISM ASSOCIATED WITH A TWO-YEAR COLLEGE EXPERIENCE*

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A. INTRODUCTION

In the study of *The Authoritarian Personality* (1), Levinson hypothesizes that ethnocentrism¹ is as closely related to the desired amount of education as it is to the actual amount of education obtained. The Levinson hypothesis suggests that among individuals of similar educational aspiration but with varying amounts of obtained education, there would be little or no difference in level of ethnocentrism. A test of this hypothesis has been needed, and it was the essential purpose of this study to investigate it.

It seems to be a general assumption that one of the purposes of a tax supported college is that of establishing particular ideological systems. Evidence of the general pervasiveness of this assumption is found either implicitly or explicitly in college bulletins, college charters, statements by educators and elsewhere. Studies related to these assumptions seem to be justified.

Among the inquiries into the effectiveness of a college education for bringing about ideological changes there have been two large-scale studies which have received considerable attention. These two studies are the Bennington Study (4, 5) conducted by Newcomb, and the initial reports of the current research undertaken at Vassar College by Sanford and others (2, 6).

In the Newcomb study, the changes in college students' attitudes were significantly in the direction of from freshman conservatism to senior non-conservatism. The study samples were groups of Bennington College students, and many observations were obtained of student attitudes over a four-year period. In Newcomb's longitudinal research, observations were made of subjects as they progressed through a four-year college program. What cannot be determined from his results is whether or not similar changes in

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¹"... is conceived as an ideological system pertaining to groups and group relations. A distinction is made between *ingroups* (those groups with which the individual identifies himself) and *outgroups* (with which he does not have a sense of belonging and which are regarded as antithetical to the ingroups). Outgroups are the subjects of negative opinions and hostile attitudes; ingroups are the objects of positive opinions and uncritically supportive attitudes, and it is considered that outgroups should be socially subordinate to ingroups" (1, p. 104).

attitudes occurred among similar subjects not enrolled in any institution of higher education at the time. It might well be that many young, high socio-economic and high ability females changed from conservatism to non-conservatism during the latter part of the economic depression of the 1930's and during what came to be called the period of the rise of the "New Deal."

The present study, differing in many respects from the Bennington study, included control or comparison groups. Due to the inclusion of control or comparison groups whose experiences were different from the subjects in college attendance, the present study might relate more to the question of the effect of the college experience than did the Bennington study.

The Bennington study was of samples of high socio-economic and high ability females, whereas the present study was of samples of males and females who were not as select in terms of economic background or in terms of ability. In the present study, the groups might be said to be more nearly representative of the majority of college students in large enrollment and tax-supported colleges than were those in the Bennington study.

The other large-scale research which is similar in some respects to the present one is the research that has been conducted by the staff of the Mary Conover Mellon Foundation at Vassar College. Apparently the over-all intention of the Foundation staff is to determine ways in which college experience affects the personality. Brown (2) reported on a 25-year follow-up of 50 selected Vassar graduates as one part of the over-all research conducted or underway at the Foundation. He made a joking reference to his paper as one which is, or should be, sub-titled "Try to Change Me," and concludes that little significant change in personality structure takes place as a result of the college experience.

Sanford, as Coördinator of the Mellon Foundation, reviewed the purposes and possibilities of such a research team on the college campus (6). In discussing the design of the Foundation's research he stated:

The general over-all design for the present research is much the same as that which holds for most large scale research into education and into psychotherapy. What policies and practices have what effects with what subjects? There must be before, intermediate and after testing, with follow-up and test results being studied in relation to intervening events (6).

He also discussed briefly a project currently underway aimed at determining, among other things, what personality and attitude changes take place during the college experience. It was not clear whether or not comparison or control groups were used or to be used.

In an attempt to measure the effect of a college experience upon ethnocentrism, Coles (3) obtained measures of ethnocentrism for a sample of college freshmen and as for a sample of college seniors. Group comparisons indicated that the seniors were significantly less ethnocentric than were the freshmen. Coles tentatively concluded that education was the factor accounting for the observed differences between samples. In his study, freshman subjects might be said to be typical of the freshman population of the college, but the senior sample was composed largely of students enrolled in classes in social science and psychology. It is possible that the seniors were select in terms of ethnocentrism when compared to the senior population of the college because of their enrollment in particular classes. This, coupled with the lack of a comparison or control group, tends to point up the need for a longitudinal study which employs some comparison or control groups. The present study was designed to accomplish this.

B. HYPOTHESES TESTED

The two hypotheses tested were:

1. Subjects who discontinue their education before the completion of the first two years of a college education, or who intended to enroll but did not, do not change significantly in ethnocentrism during a two-year period.
2. Subjects in attendance for a two-year period in college change significantly in ethnocentrism during the two-year period.

C. PROCEDURES, MATERIALS, AND SUBJECTS

There were two tests or scales used in this study: a measure of ethnocentrism and one of intelligence. The measure of ethnocentrism was a modified form of the "Total Ethnocentrism Scale: Public Opinion Questionnaire E" (1) developed for use in the study of *The Authoritarian Personality*. This scale was constructed to . . . "measure the individual's readiness to accept or oppose ethnocentric ideology as a whole (1)."

Converted scores can be assigned to each response of the subject, and the summed converted score taken as the subject's total Ethnocentrism Scale score. A high converted score is taken to mean strong support of ethnocentric ideology and a low converted score opposition to ethnocentric ideology. All scores reported in this study are in terms of converted scores.

The modification of the "Total Ethnocentrism Scale" used in this study was a modification to the extent of the elimination of two of the original 34 items. These were eliminated because they were judged to be obsolete. One

item dealt with the Japanese as enemies, and the other dealt with the treatment of enemy aliens, conscientious objectors, and draft evaders.

The second test used was the "American Council on Education Psychological Examination for College Freshmen": Forms 1948 and 1949. This test, the *ACE*, was taken to be of the several available measures of intelligence which could be used. It was used because there is a large body of information dealing with the *ACE*, and because *ACE* scores were obtained for all of the study subjects through a regular administration of the test in a matriculation battery.

In May of 1953, the modified Ethnocentrism Scale (hereinafter called the *E-Scale*) was administered to 1,049 persons who were applying for admission to San Jose State College as entering freshmen for the following September quarter. The scale was administered as one part of the Personnel Battery which is taken by all entering students at the college. Approximately 95 per cent of those persons who took the *E-Scale* at this time were still enrolled in high school, and of the remaining 5 per cent, all who had some formal education beyond a high school education were eliminated from further study. Of the 1,049 *E-Scales* administered, all but 19 were useable for purposes of this study. The 19 which had to be rejected were either incomplete, the subject could not be identified, or had had some formal education beyond a high school education.

In April of 1955, a determination of college status was made for each of the originally tested 1,030 subjects. It was found that 568 of the original 1,030 subjects were still enrolled in the college and that 462 subjects were no longer enrolled or had not enrolled at all. In May of 1955, three appeals were made to the 568 students still enrolled (hereinafter called the on-campus group) to participate in a survey of opinions, and 505 of these were re-tested with the *E-scale*. Letters asking for participation in a public opinion survey study were sent to all of the 468 subjects no longer enrolled or who had not enrolled at all (hereinafter called the off-campus group). Blank *E-Scales* and stamped return envelopes were included with the letters. Two weeks after this letter was sent, a follow-up postal card was sent to all who had not responded to the original letter. As a result of the two requests for participation, responses were obtained from 250 of the 462 off-campus subjects.

Of the 250 off-campus respondents, 13 males had transferred to other academic institutions and were eliminated from this study as were 19 females for the same reason.

D. RESULTS

The results which follow relate to three different parts of the study: *First*, the study samples as samples; *second*, comparisons to test the first hypothesis; and *third*, comparisons to test the second hypothesis. The results are reported in the above order.

1. *Results Relating to the Samples as Samples*

After the administration of the *E*-Scale in May of 1953 it was found that there were significant sex differences in mean *E*-scale scores. Females had a significantly lower mean score than did males. An obtained *t* ratio of 2.77 for uncorrelated sample means was significant beyond the .01 level of confidence. Due to this initial result, all further comparisons were made for males and for females separately.

Small, but statistically significant coefficients of correlation expressing the relationship between *ACE* and *E*-Scale scores were obtained. The *r* for males was $-.15$ and for females $-.32$. Each coefficient was significant beyond the .01 level of confidence, but the difference between the two coefficients was not significant.

After the administration of the *E*-Scale in May of 1955, it was found that there were no significant differences between those who were in the on-campus groups who responded in 1955 and those who did not respond in 1955 on either the *ACE* or the 1953 *E*-Scale. It was also the case that there were no significant differences between those who were in the off-campus groups who responded in 1955 and those who did not respond in 1955 on either the *ACE* or the 1953 *E*-Scale.

In order to determine whether or not off-campus groups were different in 1953 from on-campus groups, 1953 *E*-scale scores and *ACE* scores were compared. In the case of *E*-Scale scores, there were no significant differences between the groups called off-campus groups and those called on-campus groups. There were statistically significant differences between on-campus groups and off-campus groups on *ACE* scores. The differences between mean scores, significant beyond the .01 level of confidence, favored the on-campus groups, and supports the contention that a college education is selective with reference to measured intellect.

Due to the obtained sex difference on *E*-Scale scores, the significant correlations between *E*-Scale scores and *ACE* scores, and the obtained differences on *ACE* scores between on-campus and off-campus groups all comparisons to test the hypotheses of the study were made for matched groups and for unmatched groups.

In matching groups, an attempt was made to match the *ACE* means, σ 's and skewness of each of the pairs of groups. The 111 usable off-campus male *ACE* scores were used as a basis for matching, as were the 107 usable off-campus female *ACE* scores. The 111 *ACE* total raw scores for the off-campus males were distributed in a frequency table with a class interval of 10. Cards for the 232 on-campus males were made with *ACE* total raw scores on them. The cards were distributed into piles having an interval of 10, and each pile was shuffled. The requisite number of cards were taken off of the top of each pile and constituted the matched, on-campus male group. When there was an insufficient number of cards in any given pile, additional cards were taken from the pile of the next highest interval. The same procedure was employed to select the matched, on-campus female group.

TABLE 1
THE INITIAL STATUS OF THE MATCHED AND UNMATCHED GROUPS WITH RESPECT TO
ACE AND 1953 *E*-SCALE SCORES

	Matched groups				Unmatched groups			
	Males		Females		Males		Females	
	On-campus	Off-campus	On-campus	Off-campus	On-campus	Off-campus	On-campus	Off-campus
N	111	111	107	107	232	111	273	107
<i>ACE</i>								
M	100.27	100.28	96.46	96.46	105.19	100.28	103.55	96.46
σ	22.47	22.49	23.07	24.12	22.54	22.49	21.21	24.12
1953								
<i>E</i> -Scale								
M	92.61	89.64	90.39	89.45	92.09	89.64	86.95	89.45
σ	23.73	22.09	22.61	27.18	24.39	22.09	25.88	27.18

Statistical tests of the significance of the differences between 1953 *E*-Scale means for the matched groups of on- and off-campus males, unmatched groups of on- and off-campus males, matched groups of on- and off-campus females, and unmatched on- and off-campus females indicated that the groups were not significantly different with respect to initially measured ethnocentrism. Table 1 is a summary table and can serve as an indication of the initial status of the study samples which were compared after two years to determine if changes in ethnocentrism occurred, and if so, in whom.

2. Results Relating to the First Hypothesis

With respect to the first hypothesis, mean 1953 *E*-Scale scores and mean 1955 *E*-scale scores for off-campus groups were compared using a significance

test for correlated sample means. The significance test was employed to determine whether or not there was a statistically significant difference between the 1953 *E*-scale scores and the 1955 *E*-scale scores for the off-campus subjects. Table 2, in rows headed *A* and *B*, contains the relevant data for the off-campus male comparison and the off-campus female comparison for the two-year period. The low *p* values obtained indicate that neither the off-campus males nor the off-campus females changed significantly in ethnocentrism over the two-year period.

TABLE 2
THE COMPARISONS OF 1953 *E*-SCALE AND 1955 *E*-SCALE SCORES FOR ALL STUDY GROUPS

	<i>E</i> -Scale 1953			<i>E</i> -Scale 1955			<i>r</i>	<i>t</i>	<i>p</i>
	<i>N</i>	<i>M</i>	σ	<i>N</i>	<i>M</i>	σ			
<i>A</i>	111	89.64	22.09	111	86.21	24.23	.53	1.60	>.05
<i>B</i>	107	89.45	27.18	107	85.22	25.71	.60	1.84	>.05
<i>C</i>	111	92.61	23.73	111	76.34	20.78	.66	8.91	<.01
<i>D</i>	232	92.09	24.39	232	80.45	22.38	.65	9.02	<.01
<i>E</i>	107	90.39	22.61	107	70.39	20.20	.67	11.76	<.01
<i>F</i>	273	86.95	25.88	273	75.09	24.90	.69	9.80	<.01

Where: *A* is the off-campus male group.

B is the off-campus female group.

C is the matched on-campus male group.

D is the unmatched on-campus male group.

E is the matched on-campus female group.

F is the unmatched on-campus female group.

3. Results Relating to the Second Hypothesis

With respect to the second hypothesis, mean 1953 *E*-Scale scores and mean 1955 *E*-Scale scores were compared for on-campus groups using a significance test for correlated sample means. The significance test was employed to determine whether or not there was a statistically significant difference between the 1953 *E*-Scale scores and the 1955 *E*-Scale scores for the on-campus subjects. These comparisons were made for the on-campus groups which were matched on *ACE* scores with the off-campus groups, and also for on-campus groups which were unmatched. Table 2, Rows *B*, *C*, *D*, *E*, and *F*, contains the relevant data for the matched and unmatched on-campus groups.

The *p* values for the on-campus groups indicate a difference between 1953 *E*-Scale scores and 1955 *E*-Scale scores which is significant beyond the .01 level of confidence in each of the comparisons.

To make clear the extent of the differences between the on-campus and the off-campus groups with respect to shift in ethnocentrism, additional comparisons were made. It will be remembered that neither the on-campus and

off-campus males nor the on-campus and off-campus females were significantly different with respect to 1953 *E*-Scale scores. Tests of the significance of the difference between 1955 *E*-scale scores for matched on-campus and off-campus males, unmatched on-campus and off-campus males, matched on-campus and off-campus females, and unmatched on-campus and off-campus females were conducted to point up the differences found in the other comparisons reported. In all such comparisons, the on-campus groups had statistically significantly lower mean 1955 *E*-Scale scores than did the off-campus groups.

E. DISCUSSION

In terms of the stated hypotheses of this study, the obtained results for all study groups support the hypotheses. The comparisons reported indicate that there were significant changes in ethnocentrism in the on-campus groups, and no significant changes in ethnocentrism in the off-campus groups. The changes in ethnocentrism for the on-campus groups were in the direction of decreased acceptance of ethnocentric ideology, and indicate that there is associated with a two-year college experience a decrease in ethnocentrism.

Although the results are only suggestive, it seems that persons who leave college before completing the first two years, or who intended to enroll but did not, do not necessarily become more ethnocentric than they were before entering or planning to enter college.

The results of this study tend to call for a further evaluation of the Levinson hypothesis that aspiration for education and actual amount of education are of equal import in level of ethnocentrism. It has been assumed, in this study, that there is reason to conclude that the study subjects in 1953 had equal aspiration for education. The findings indicate that with an actual increment in education there is associated with this education received a change in level of ethnocentrism.

F. SUMMARY

It was hypothesized that those who complete a two-year college experience change significantly in measured ethnocentrism during the two-year period. It was further hypothesized that those who initiate a college experience, but who do not matriculate or who discontinue their education before completing a two-year college experience do not change significantly in measured ethnocentrism during the two-year period.

A modified form of the Ethnocentrism scale from the *Authoritarian Personality* was administered to 1,030 subjects in May of 1953. The same scale

was administered to 755 of these original subjects in May of 1955. Of the 755 retested, 250 were individuals who had intended to enroll in college but had not or were subjects who had enrolled but who had withdrawn from college before completing the second year. These 250 subjects were referred to as the off-campus subjects. Of the 755 retested, 505 completed two years of college work and were referred to as the on-campus subjects. Due to the finding that there were significant sex differences in ethnocentrism scores with females having a lower mean score than males, all groups were divided into male and female subjects and all comparisons were for on- and off-campus male or female groups.

It was found that on-campus groups changed significantly in the direction of decreased ethnocentrism, and that off-campus groups did not change significantly in ethnocentrism. This general finding suggests that the Levinson hypothesis that aspiration for education and amount of education are of equal import in ethnocentrism needs further evaluation.

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ATTITUDE TOWARD AGING OF INDIVIDUALS WITH EXPERIENCES WITH THE AGED*¹

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The attitudes toward aging of widely different groups show considerable agreement with the misconceptions and stereotypes about old people and the older worker. The widely different groups range from high school students to institutionalized aged (1, 2, 3, 4, 5, 6). Such evidence was obtained by two questionnaires in which respondents indicated acceptance or rejection of specific statements by a "yes" or "no." The questionnaire about old people consisted of 137 statements about physical change, insecurity, personality traits, conservatism, etc.; the questionnaire about the older worker consisted of 51 statements about interpersonal relationships, mental decline, attitudes toward the job, etc. Statements like "Old people need glasses to read," "They are slow," "They have lost most of their teeth" are supported by some experimental evidence; but, the majority of the statements, e.g., "Old people are hard to get along with," "They never take a bath," "Older workers cannot take criticism without getting angry" have little or no support from empirical research.

In 1953, the Federation of Protestant Welfare Agencies of New York sponsored a lecture-discussion series on aging, designed to inform agency board and staff members and volunteers of new developments and new ideas for dealing with older people. Ninety-two men and women, ranging in age from 25 to 79 years, attended the series. The average age of the group was 56. The group, hereafter referred to as "lecture group," included individuals currently employed or who prior to retirement had been employed as social workers, directors of homes for the aged, ministers, occupational therapists, teachers, YMCA secretaries, industrial executives, trade unionists, and public relations experts.

It was thus possible to compare attitudes of the lecture group toward old people and the older worker with those of older groups. Presumably, the attitude toward aging of the lecture group should be different (or more

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favorable) since in their direct contact with old people, as paid or volunteer workers, they have had an opportunity to understand better aging and the aged.

To estimate the attitudes of the lecture group, 50 statements were selected, 40 from the questionnaire about old people and 10 from the one about the older worker. The statements were those on which there were differences between young and old, or between institutionalized and noninstitutionalized older people. The new 50-statement questionnaire was administered to the lecture group at the first session.

Within the lecture group, there was no difference between respondents under the age of 60 and those over 60 in the amount of acceptance of the stereotype for each of the 50 statements. The comparison, therefore, between the lecture group and other groups is based on the whole lecture group. Comparisons are reported in Table 1 between the lecture group and college undergraduates (average age 19), graduate students (average age 32), middle-aged (average age 50), and older-aged adults (average age 75).

Sixteen statements show significant differences between the lecture group and undergraduates and 15 statements show significant differences between the lecture group and graduate students. Using only statements which differentiate between the lecture group and undergraduates and/or graduate students, it is evident that the lecture group tends not to accept the stereotypes to the same degree that do undergraduates. On the other hand, the lecture group does believe more in the stereotypes than do graduate students.

The lecture group agrees more than do either the undergraduates or the graduate students with the statements that old people "are better off in old age homes," "are afraid of the dark," and that the older workers are "unsure of themselves" and "get rattled when rushed." The lecture group agrees less than either student group with the statements that old people are "old-fashioned," "like religious programs on the radio," "are bad patients when ill," and "dislike any changes or interference with established ways of doing things." These specific attitudes probably reflect differences in orientation to, and experience with, the old. It must be pointed out, however, for the questionnaire as a whole, that the median percentage of agreement for the 50 stereotypes is 30 per cent for the lecture group, 35 per cent for undergraduate students, and 27 per cent for graduate students. Agreement between the proportions accepting each of the 50 statements is correlated between the lecture group and undergraduate students. The correlation is .82. The correlation between the lecture group and graduate students is .88.

Between the lecture group and the middle-aged and the older-aged there are significant differences, however, not only in individual statements but also for all 50 statements. For 33 statements, differences between lecture group and middle-aged are significant; for 32 statements, between lecture group and older-aged. For both comparisons, the amount of acceptance of the stereotype is lower for the lecture group. For the 50 statements as a whole, the median percentage of agreement is 50 per cent for middle-aged, and 51 per cent for older-aged in contrast to 30 per cent for the lecture group. The correlation between the percentages for the lecture group and middle-aged, and between lecture group and older-aged is .78 and .74, respectively, for the 50 statements. This suggests that the essential difference between the lecture group and middle-aged and older-aged is in the magnitude of acceptance.

More of the lecture group, however, respond by avoiding answers, e.g., circling yes and no or failing to respond. The median percentage of avoidance is 15 per cent for the lecture group, but less than one-half per cent for undergraduates and middle-aged, one per cent for graduate students, and six per cent for older-aged.

Another aspect of the schedule sought answers to the questions "In your opinion when does old age begin?" and "In your opinion at what age is a worker old?" For "... when does old age begin," the lecture group rejects more than the other groups the notion that old age begins at a specific chronological age, although 20 per cent avoid answering the question. For the lecture group, 22 per cent specified a chronological age, but undergraduates, graduate students, middle-aged, and older-aged, respectively, did specify such an age in 85 per cent, 62 per cent, 97 per cent, and 53 per cent of the protocols. For those in the lecture group who define old age in terms of chronological age, the ages specified range from birth to 80 years, with a median of 61 years. For those who define old age in other terms 26 per cent say, "depends on the individual," 14 per cent, "interest in living is lost," 12 per cent, "physical and mental decline," 4 per cent, "feel old," and 2 per cent give other reasons.

Responses to the question, "... at what age is a worker old?" show a similar pattern. Twenty-one per cent avoid answering the question. Twenty per cent believe that a worker becomes old at a specific chronological age, compared with 84 per cent for undergraduates, 60 per cent for graduate students, 95 per cent for middle-aged, and 55 per cent for older-aged. For the lecture group, the age specified at which a worker becomes old ranges from 50 to 75, with a median of 69 years. For those who consider a worker

TABLE 1
COMPARISON OF LECTURE GROUP, AND UNDERGRADUATES, GRADUATE STUDENTS, MIDDLE-AGED, AND OLDER-AGED RESPONDENTS FOR 40
STATEMENTS ABOUT OLD PEOPLE, 1. AND 10 STATEMENTS ABOUT THE OLDER WORKER: PROPORTION OF EACH GROUP IN
AGREEMENT WITH THE STATEMENT

Statement	Lecture <i>N</i> = 92 %	Under- Graduates <i>N</i> = 100 %	Graduate students <i>N</i> = 500 %	Middle- aged <i>N</i> = 100 %	Older- aged <i>N</i> = 100 %
<i>Older People:</i>					
1. Need glasses to read	62	73	56	80*	88*
2. Repeat themselves in conversation	54	49	57	77*	64
3. Cannot learn new things	10	11	11	38*	52*
4. Prefer to be alone	7	6	5	25*	23*
5. Are grouchy	11	23*	13	46*	40*
6. Are better off in old age homes	16	3*	6*	12	61*
7. Expect their children to support them	13	34*	20	32*	42*
8. Are easily moved to tears	28	39	27	64*	58*
9. Are old-fashioned	26	60*	52*	65*	41*
10. Are a burden to their children	26	18	18	22	54*
11. Feel sorry for themselves	36	31	30	46	42
12. Are hard to get along with	24	23	17	35	44*
13. Are unproductive	20	24	15	42*	48*
14. Are hard of hearing	36	41	38	64*	72*
15. Believe in life after death	50	62	72*	79*	46
16. Cannot manage their own affairs	16	15	11	45*	44*
17. Would like to be young again	49	78*	56	78*	61
18. Are touchy	42	48	39	74*	71*
19. Never had it better	13	6	9	41*	52*
20. Like religious programs on the radio	42	64*	62*	82*	57*
21. Should not marry	16	29*	11	54*	35*
22. Are afraid of the dark	12	3*	5*	17	10
23. Like to be waited on	39	46	35	57*	67*
24. Spend much time in bed because of illness	20	22	16	31	51*
25. Have poor coordination	35	58*	46	59*	48
26. Hide their money	21	28	24	54*	40*

TABLE 1 (continued)

Statement	Lecture N = 92 %	Under- Graduates N = 100 %	Graduate students N = 500 %	Middle- aged N = 100 %	Older- aged N = 100 %
27. Feel tired most of the time	29	35	31	58*	49*
28. Are bad patients when ill	16	40*	28*	50*	41*
29. Are afraid of death	20	30	21	40*	26
30. Prefer old friends rather than make new ones	57	78*	66	81*	65
31. Love life	74	70	81	95*	90*
32. Are selfish	25	16	12*	25	41*
33. Spend most of their time reading or listening to the radio	36	51*	45	74*	74*
34. Dislike any changes or interference with established ways of doing things	58	74*	73*	82*	67
35. Meddle in other people's affairs	27	37	26	37	52*
36. Have no interest in the opposite sex	16	23	13	47*	37*
37. Cannot concentrate, even on simple tasks	11	11	6	39*	49*
38. Like to gossip	54	64	56	59	63
39. Are careless about their table manners	23	22	17	40*	44*
40. Are a nuisance to others	13	9	6*	22	30*
<i>Older workers:</i>					
41. Are slow	69	58	58*	68	65
42. Fail to keep up with changing methods of work	41	32	34	48	45
43. Are unsure of themselves	43	16*	16*	44	45
44. Get rattled when rushed	70	45*	39*	64	68
45. Are interested more in security than job advancement	81	75	69*	79	70
46. Are critical of younger workers	38	59*	48	68*	46
47. Cannot take criticism without getting angry	30	34	28	50*	54*
48. Need more time to learn new operations	70	62	68	66	75
49. Are critical of their fellow workers	33	34	30	43	41
50. Cannot listen to other people's complaints without getting irritated	24	24	12*	39*	57*

*Significant difference between lecture group and particular sample.

old in other terms, 32 per cent say "depends on the individual," 6 per cent, "loss of interest in living," 6 per cent, "unable to work," 4 per cent, "physical and mental decline," 4 per cent, "decrease in job efficiency," and 6 per cent give other reasons.

Individuals who have had more direct contact with a variety of old people tend to be somewhat less negative in their attitudes toward aging than those whose acquaintance is more limited and constrained. It must be recognized that the lecture group does evade answering many specific questions about aging.

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THE PLASTICITY OF THE PHYSIQUE FROM EARLY- ADOLESCENCE THROUGH ADULTHOOD*

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A. INTRODUCTION

As a measure of body morphology, the somatotype may be considered a more "molar" unit than such single-dimensional measures as height or weight. A unique opportunity² to undertake a study of changes in physique with maturation was available to the present writer while at the University of California's Institute of Child Welfare, where one of the measures taken on the subjects of the Adolescent Growth Study was the somatotype. This measure of physique has not, to the writer's knowledge, been previously used to assess and evaluate change in the somatotype, since more attention has been paid to its nonchangeable, static character. The object of the present study was to determine not only the degree of stability of the somatotype with age-change, but also growth-patterns in the components of the somatotype in males and females.

B. DESIGN OF THE STUDY

1. *The Subjects*

The procedure for selection of cases for the Adolescent Growth Study has been previously described by Dr. Harold E. Jones (6). At the onset of the study, the subjects were all members of the fifth grade in several Oakland, California, schools located in districts characterized by differences in socio-economic status. Most subjects were of "old American" or North European racial stock. The object of the selection was to obtain as "normal" or representative a sample of American grade-school youngsters as possible under the prevailing restrictions of the geographical area. The number of subjects somatotyped at each age-level depended on their availability for the procedure. Easy access during the grade- and high-school periods made a relatively large *N* possible for the sets of photographs obtained at 12 and 17 years. Thus 74 males and 78 females were somatotyped at those ages. At

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²An opportunity generously provided by Dr. Harold E. Jones, Director of the Institute of Child Welfare.

age 33, however, the number of males and females available for the photographing fell off; 38 males as compared with 39 females.

2. *The Establishment of Subgroups*

Since validity is determined in part by the consistency of findings or agreement with other findings, subgroups of early-, late-, and average-maturing males and females were established from the total group which would allow comparisons with the results of other studies of physique utilizing groups of early-, late-, and average-maturing individuals.

A number of studies (7, 9, 10, 11, 12, 13, 14) have described some of the growth characteristics of adolescents maturing at different rates. Several studies (1, 2, 3, 4, 5) of this nature have been based on the data of the Adolescent Growth Study. These subgroupings, therefore, were readily available to the present investigator. They consisted of individuals of both sexes most markedly retarded or accelerated in their skeletal development (relative to their chronological ages during the adolescent years) plus all individuals who were neither accelerated nor retarded.

Among males at ages 12 and 17, there were 13 boys in the somatotyped group who were considered to be early-maturing, 18 who were considered late-maturing, and 43 average-maturing. The total *N* for males, as stated previously, was 74. The numbers of early-, late-, and average-maturing males remaining in the somatotyped group at age 33 were, respectively, 8, 11, and 19.

Among females at ages 12 and 17, there were 17 early-maturing, 18 late-maturing, and 43 average-maturing. At age 33, there remained 11 early-maturing, 9 late-maturing, and 19 average-maturing. As previously stated, the total female *N* was 78.

3. *The Body-Components*

Sheldon (8) has defined the somatotype components as follows:

Endomorphy, or the first component: relative predominance in the bodily economy of structure associated with digestion and assimilation. Relatively great development of the digestive viscera . . . endomorphy means relative predominance of the vegetative system, with a consequent tendency to put on fat easily. . . .

Mesomorphy, or the second component: relative predominance of the mesodermally derived tissues, which are chiefly bone, muscle and connective tissue. . . . Mesomorphs tend toward massive strength and muscular development. . . .

Ectomorphy, or the third component: relative predominance of the skin and its appendages, which include the nervous system. . . . In the

ectomorph there is relatively little body mass and relatively great surface area—therefore great sensory exposure to the outside world. They have given up mass for surface, in a sense suppressing the primacy of both the digestive organ-system and the motor organ-system in favor of the sensory organ-system (pp. 15-16).

The scale for measurement of the components adopted by Sheldon was a 7-point one on which each step in the progression from 1 through 7 represents an "equal-appearing" interval. Seven signifies the greatest amount which an individual can possess of any given component; 1 represents the least amount. A weight of 0 is not applied to the scale because Sheldon considers that all individuals have at least some amount of each component in their somatotype. A rating of four marks the midpoint in the quantity of any component which an individual may possess.

4. *The Rating Procedure*

An experienced somatotyper, Mrs. Barbara Heath, rated the photographs of the subjects taken in the manner prescribed by Sheldon at or about ages 12, 17, and 33. The sets of photographs at each age were sent to the rater at various times within a six-month period. Instructions were for her to rate each set with no reference to any other. It is to be noted, however, that any residual carry-over of impressions of somatotypes of subjects from one age to the next would tend to promote an error *against* the leading hypothesis of this study (namely, that characteristic changes in physique occur with growth in both males and females) since somatotypers are more generally oriented toward demonstrating *constancy* rather than *changes* in the somatotype.

C. THE RESULTS

1. *Age-Changes in Components in Males and Females*

Table 1 reports means, *SD*'s, and mean-score differences for the total group and subgroups of males and females at ages 12, 17, and 33.

Inspection of the left-hand side of the table (male total group and subgroups) will indicate changes in components with age in the following directions: endomorphy tapers off slightly from 12 to 17, then increases between 17 and 33; ectomorphy "develops" from 12 to 17, then declines from 17 to 33; ectomorphy "develops" from 12 to 17, then declines from 17 to 33. Greatest and most consistent growth occurs in mesomorphy, which increases from 12 to 17 and from 17 to 33. The difference between mean levels at 12 and 33 is significant at the .05 level.

The patterns of change for the subgroups (early-, average-, and late-

TABLE 1
MEANS, DIFFERENCES BETWEEN MEANS AT VARIOUS AGES (12, 17 AND 33), AND SD'S OF MALE AND FEMALE SOMATOTYPE RATINGS ON INDIVIDUAL COMPONENTS FOR TOTAL AND SUBGROUPS

	Total males ($N = 74$ at 12 and 17, 38 at 33)		Early- maturing males ($N = 13$ at 12 and 17, 8 at 33)		Late- maturing males ($N = 18$ at 12 and 17, 11 at 33)		Average- maturing males ($N = 43$ at 12 and 17, 19 at 33)		Total females ($N = 78$ at 12 and 17, 39 at 33)		Early- maturing females ($N = 17$ at 12 and 17, 11 at 33)		Late- maturing females ($N = 18$ at 12 and 17, 9 at 33)		Average- maturing females ($N = 43$ at 12 and 17, 19 at 33)	
	M	σ	M	σ	M	σ	M	σ	M	σ	M	σ	M	σ	M	σ
<i>Endomorphy</i>																
(1) 12	3.23	.96	3.27	.97	3.22	.69	3.22	1.04	3.90	.99	4.53	1.08	3.81	.96	3.70	.86
(2) 17	2.86	.68	2.76	.70	2.89	.63	2.83	.81	4.34	.62	4.68	.73	4.25	.65	4.23	.60
(3) 33	3.04	.68	2.88	.67	3.09	.77	3.08	.66	4.65	.48	4.59	.47	4.72	.48	4.66	.49
diff. (1-2)	.37	—	.51	—	.33	—	.39	—	.44	—	.15	—	.44	—	.53	—
diff. (2-3)	.18	—	.12	—	.20	—	.25	—	.31	—	.09	—	.47	—	.43	—
diff. (1-3)	.19	—	.39	—	.13	—	.14	—	.75	—	.06	—	.91	—	.96	—
<i>Mesomorphy</i>																
(1) 12	3.30	.72	3.35	.57	3.11	.77	3.36	.70	3.31	.74	3.59	.71	3.25	.79	3.23	.81
(2) 17	4.06	.81	4.27	.70	3.86	.86	4.08	.81	3.51	.76	3.74	.75	3.42	.63	3.45	.79
(3) 33	4.70	.80	4.63	.86	4.50	.74	4.84	.78	3.92	.71	4.14	.68	3.89	.66	3.82	.73
diff. (1-2)	.76	—	.92	—	.75	—	.72	—	.70	—	.15	—	.17	—	.22	—
diff. (2-3)	.64	—	.36	—	.64	—	.76	—	.41	—	.40	—	.47	—	.37	—
diff. (1-3)	1.40*	—	1.28	—	1.39	—	1.48*	—	.61	—	.55	—	.64	—	.49	—
<i>Ectomorphy</i>																
(1) 12	3.86	.94	3.88	.90	3.94	.86	3.83	.99	3.46	1.26	2.65	1.04	3.58	1.23	3.72	1.24
(2) 17	4.25	.94	4.04	.87	4.36	.91	4.27	.95	3.27	1.25	2.44	1.01	3.64	1.08	3.44	1.25
(3) 33	3.68	1.10	3.69	.95	3.77	1.15	3.63	1.13	2.77	.99	2.50	.83	2.72	.71	2.95	1.13
diff. (1-2)	.39	—	.16	—	.42	—	.44	—	.19	—	.21	—	.06	—	.28	—
diff. (2-3)	.57	—	.35	—	.59	—	.64	—	.50	—	.06	—	.92	—	.49	—
diff. (1-3)	.18	—	.19	—	.17	—	.20	—	.69	—	.15	—	.86	—	.77	—

*Significant at .05 level.

maturing males) is generally similar to that of the total group, suggesting that rate of maturation in males has no permanent effect on physique. It is interesting that in terms of *physique* there were no differences demonstrated, for example, between early- and late-maturing boys in early- or late-adolescence.

The pattern for the total group, however, is quite consistent with the "naïve" observation that males tend to get relatively bigger through the upper chest and shoulder regions as they grow older.

The right-hand side of Table 1 indicates age-changes in female somatotypes for the total group and subgroups. The following changes occur: mesomorphy increases slightly from 12 to 17 and from 17 to 33; endomorphy rises consistently and ectomorphy declines consistently from 12 to 17 and from 17 to 33.

While the subgroups show a general pattern similar to that of the total group, significant mean-score differences were found *between* subgroups at ages 12 and 17. At 12 years, the difference in endomorphic means between the early- and late-maturing subgroups was significant ($P < .05$) as was the difference between the early-maturing and average-maturing subgroups ($P < .05$). The early-maturing subgroup had a significantly higher level of endomorphy than either the average- or late-maturing. Significant differences were found also, as one might suspect, in the level of ectomorphy at age 12. Here the early-maturing females had a significantly lower level ($P < .05$) than either the average- or late-maturing females. This significant difference in level of ectomorphy persisted through age 17, the directions of the differences being the same as those found at age 12.

These subgroup differences in levels of endomorphy and ectomorphy (although it shall soon be shown that these components are highly interrelated) during adolescence are findings which are consistent with Sullivan's (15) that "broad-built" girls (i.e., high on endomorphy and/or low on ectomorphy) tend to be the early-maturing. Bayley's (2, p. 62) criticism of Sullivan's report—that she, Sullivan, did not consider growth throughout the entire period of adolescence but restricted herself to an examination of early-adolescence only—is therefore probably not crucial.

In general, growth in the individual components appears more consistent in females than males. Although changes in levels with maturation did not reach the statistical criterion of significance, the differences were in quite expected directions: e.g., females "developing" endomorphy, males "developing" mesomorphy.

TABLE 2
INTERCORRELATIONS OF SOMATOTYPE COMPONENTS DERIVED FROM RATINGS ON MALE AND FEMALE SUBJECTS FOR BODY-TYPE AT
12, 17, AND 33 YEARS

Groups	Somatotype at 12 yrs.			Somatotype at 17 yrs.			Somatotype at 33 yrs.		
	Endo.	Meso.	Ecto.	Endo.	Meso.	Ecto.	Endo.	Meso.	Ecto.
<i>Total males:</i>									
(N = 74 at ages	Endo.								
12 and 17,	Meso.	.415	-.505		.285	-.573		.144	-.395
38 at age 33)	Ecto.		-.805			-.736			-.901
<i>Averaging-maturing males:</i>									
(N = 43 at ages	Endo.								
12 and 17,	Meso.	.382	-.814		.497	-.521		.179	-.522
19 at age 33)	Ecto.		-.793			-.832			-.962
<i>Total females:</i>									
(N = 78 at ages	Endo.								
12 and 17,	Meso.	.713	-.907		.623	-.972		.126	-.473
39 at age 33)	Ecto.		-.843			-.801			-.763
<i>Averaging-maturing females:</i>									
(N = 43 at ages	Endo.								
12 and 17,	Meso.	.621	-.942		.581	-.977		.264	-.582
19 at age 33)	Ecto.		-.661			-.854			-.974

2. Relationships between Components

a. Analysis of male somatotypes. The first half of Table 2 reports results of intercorrelations of components of the male somatotypes at ages 12, 17, and 33. The statistic employed to determine the degree of correlation was the Pearson r .

The first half of the table shows that intercorrelations at all ages of ratings on endomorphy and mesomorphy are lowest; of ratings on endomorphy and ectomorphy somewhat higher; and of ratings on mesomorphy and ectomorphy highest. The intercorrelations of ratings on mesomorphy and ectomorphy are not only highest but also maintain a very consistent level (from $-.805$ at age 12 to $-.901$ at age 33). Intercorrelations between endomorphy and mesomorphy ratings drop with maturation (from $.415$ at age 12 to $.144$ at age 33).

Ratings of the male somatotypes appear to have been made utilizing a single dimension or continuum, with mesomorphy occupying one pole of the continuum, ectomorphy the other, and endomorphy somewhere intermediate. At age 33 (that is, in somatotyping the adult male physique) the possibility of *two* independent continua arises, endomorphy and a combined mesomorphy-ectomorphy dimension. Apparently, the degree of maturation of the physique appears to have had some effect on the statistical independence of the somatotype components.

b. Analysis of the female somatotypes. The second half of Table 2 reports intercorrelations between the components for the female group as a whole and the relatively more "homogeneous" average-maturing subgroup. The pattern of intercorrelations is somewhat similar to that obtained in the analysis of male somatotypes, except that at the earlier ages (12 and 17) intercorrelations between ratings of endomorphy and mesomorphy are of a higher order than comparable ones for males.

While ratings again appear to have been made on the basis of a single dimension or continuum, in the case of *females* endomorphy and ectomorphy (rather than mesomorphy and ectomorphy, as was apparently the case for males) seem to occupy the poles of the continuum and mesomorphy seems to be intermediate. Again, as was the case in the analysis of male somatotypes, the degree of maturation of the somatotype appears to have had an effect on the degree of statistical independence between the components. In general, greater independence was achieved in somatotyping the adult physique. Comparing both male and female patterns of intercorrelation, sex differences seem also to have had an effect on the degree of statistical independence of the components.

3. *The Stability of the Somatotype*

a. *Intra-rater consistency.* Table 3 reports correlations between sets of Heath ratings of male and female somatotypes at ages 12, 17, and 33. Fairly high correlations were obtained between age 12 and 17 ratings, and, with a

TABLE 3
CORRELATIONS OF HEATH RATINGS FOR MALE AND FEMALE SOMATOTYPE BETWEEN
AGES 12 x 17 AND 17 x 33

Groups	Endomorphy		Mesomorphy		Ectomorphy	
	12 x 17	17 x 33	12 x 17	17 x 33	12 x 17	17 x 33
Total males ($N = 74$ at ages 12 and 17, 38 at 33)	.663	.023	.731	.823	.707	.764
Average-maturing males ($N = 43$ at ages 12 and 17, 19 at 33)	.550	— .025	.723	.966	.681	.753
Total females ($N = 78$ at ages 12 and 17, 39 at 33)	.668	.247	.832	.787	.843	.717
Average-maturing females ($N = 43$ at ages 12 and 17, 19 at 33)	.515	.051	.682	.773	.848	.690

single important exception, fairly high correlations were obtained between age 17 and 33 ratings—that exception involving the endomorphic component. In the case of both males and females, correlations of ratings on the endomorphic component are consistently low. The endomorphic component appears to be subject to a great deal of random fluctuation between the periods of late-adolescence and adulthood.

TABLE 4
CORRELATIONS BETWEEN JUDGES' RATINGS OF SOMATOTYPE AT AGES 17 (MALES) AND 33
(MALES AND FEMALES)

Groups	Endomorphy		Mesomorphy		Ectomorphy	
	17	33	17	33	17	33
Males ($N = 74$ at 17, 38 at 33)	.613	.729	.797	.857	.679	.893
Females ($N = 78$ at 17, 39 at 33)	—	.237	—	.741	—	.832

b. *Inter-rater reliability.* Table 4 presents correlations between sets of ratings made by the main judge (Mrs. Heath) and another judge (W. H. Sheldon) on somatotypes at ages 17 and 33. Dr. Sheldon did his set of age 33 ratings by inspection of photographs and supervised the age 17 ratings

which were turned out "mechanically" by the Harvard Somatotyping Machine.

Agreement between the judges, as can be seen, is fairly high in all cases but one. Relatively poor agreement occurs on ratings of the endomorphic component in *adult females*.

D. DISCUSSION

Generally speaking, a picture of gradual change with maturation in the physiques of males and females was encountered rather than one of radical change. Males took on mesomorphy as they grew older, females tended to take on endomorphy. Growth in the components fluctuated somewhat more in males than females. In line with Sullivan's finding, early-maturing girls seem to be more endomorphic (i.e. more "broad-built") during adolescence than either average- or late-maturing girls.

The somatotype, with the exception of the endomorphic component, was found to be a fairly stable index of physique from early-adolescence through adulthood. The endomorphic component seems to be unusually subject to random fluctuations from late-adolescence to adulthood, although it tends to be fairly stable within the adolescent years.

E. SUMMARY

This study employed comparable sets of somatotype ratings on male and female subjects of the Adolescent Growth Study taken at ages 12, 17, and 33. The purpose of this procedure was to assess and evaluate such changes in the somatotype as occurred with maturation. The findings may be summarized as follows:

- 1 Major growth in males with maturation occurred in the mesomorphic component; in females, in the endomorphic component. Growth in individual components appeared somewhat more stable in females than males.
2. Significant differences in levels of endomorphy and ectomorphy (which were found to be highly intercorrelated as components) occurred between subgroups of early-, average-, and late-maturing females during adolescence; these differences did not persist into adulthood.
3. With the exception of the endomorphic component, the somatotype tended to be fairly stable and consistent from early-adolescence through adulthood.

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STUDIES IN SOCIAL PERCEPTION: METHODOLOGY*

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A. INTRODUCTION

How does the child *see* the world? Or, to put it another way, what is a child's world? These questions are being raised by parents, teachers, and an increasing number of adults who are trying to help children grow up in our complex society. The beginning point to an answer lies in the realm of perception. This report will describe the methodology being employed to examine the social perception of elementary school children in relation to life situations typical of American culture.¹ It will make explicit the numerous factors which must be taken into account in studying perceptual behavior, and demonstrate one technique based on these criteria.

That people "see" things differently has long been recognized. The idea is imbedded in our folklore as evidenced in the story of the six blind men describing an elephant, and the adage that "there are two sides (at least) to every question." Great works of art and literature are usually distinguished by an acute sensitivity to the different ways in which people view the same thing or event. At the close of the eighteenth century, William Blake (2, pp. 114-115) summed up his observations in these words:

I see everything I paint in this world, but everybody does not see alike. To the eyes of a miser a guinea is far more beautiful than the sun, and a bag worn with the use of money has more beautiful proportions than a vine filled with grapes. The tree which moves some to tears of joy is in the eyes of others only a green thing which stands in the way.

Man's senses, point of view, emotions, and values have been linked with perception by creative thinkers of all ages.

It is becoming increasingly clear, too, that behavior is determined, in part, by the interpretation made of the situation. Chances are that the driver

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of a car whose gasoline tank is "half empty" is looking for different road signs than one whose gasoline tank is "half full." Whether an assignment is regarded as an opportunity or a chore is likely to be reflected in the way in which it is carried out by the perceiver. What evidence there is seems to support the position that to understand the individual we must know how he views *his* world; that to change his behavior it is often necessary to begin by helping him reinterpret the situation. This relationship of perception to behavior is as true of situations calling for academic problem-solving skills as it is for human-relations situations involving "personality."

The study of perception, consequently, has had a long and continuing history. Philosophers of every generation have debated the question of what is "real." With the development of psychology has come a better understanding of certain perceptual processes involving eye movements, figure-ground orientation, and determinants of physical properties as well as the mechanism of projection used in personality assessment. Educators have also given increasing regard to the way in which the learner interprets the learning situation from the standpoint of purposes and the rôles of participants engaged in the educational enterprise. Out of these efforts have arisen a number of interesting theories of perception more notable for their diversity than for common agreements regarding perceptual behavior (1).

B. OVERVIEW OF THE STUDY

The present study is based on three propositions regarding the nature of social perception. First, the perceptual act is *a response to selected elements* in a social situation rather than to the total complex of stimuli. Second, social perception involves the *ascribing of meaning* to the situation as perceived by the individual. Third, perceptual behavior *involves the emotions*.

To elicit data which might give evidence bearing on the above propositions, a projective-type technique was employed. A Life-Situation Picture Series was devised consisting of 14 scenes encompassing various social backgrounds, social functions, and perceptual processes. Following a group orientation period, this instrument was administered to subjects individually in three parts. First, 2" x 2" black and white slides were projected on a screen and the subject was directed to "tell a story" about each. Next, the same pictures were presented in the form of 8½" x 11" photographs and the subject selected from among eight cardboard figures of boys and girls (happy, sad, angry, neutral) the one which "belongs in the picture." Last, the subject indicated the three pictures he liked best (copies of which he was given) and the one least preferred. All responses were tape recorded and typewritten verbatim.

The experiment was designed to test the hypothesis that social perception is related to differences in type of community lived in, sex, age, and intelligence. Of the total of 88 subjects selected at random, half were drawn in equal proportions from the first and sixth grade children attending one-room schools in a rural Wisconsin county. The other 44 subjects were similarly selected from the first and sixth grade pupils attending the public elementary schools of a Wisconsin community of approximately 55,000 population located in a highly urbanized region. Sex was equated within each grade level for both rural and urban samples thus providing eight subgroups of 11 subjects each. Intelligence groups were formed by selecting the two persons having the highest Intelligence Quotient in each of the eight subgroups to constitute the high-ability sample, and using similar procedures at the opposite extreme to form the low-ability group.

Data were gathered over a four-month period, an attempt being made to sample the eight subgroups proportionately. All the social perception interviews were conducted by the same person. Approximately one week to one month after this interview, the Stanford-Binet Intelligence Test was administered by another examiner.

Typescripts made from tape recordings of the social-perception interviews provided data bearing on a number of different aspects of social perception. It was possible to determine the specific elements in each life situation which the subject selected to talk about (perceptual referents), and to note whether they were merely identified or incorporated in some form of higher mental process (response level). Whether an over-all recognition of the life situation had been made, and whether meaning was expressed in terms of objective characteristics or as social functions could also be ascertained. The spatial and temporal settings in which the life situation was placed by the subject were likewise indicated by the data. Attitudes and values were expressed throughout the protocols and, hence, were accessible for evaluation. In addition, there were measures of word productivity and attention time for each life-situation picture.

C. LIFE-SITUATION PICTURE SERIES

1. *Criteria*

The nature of the child, the culture in which he lives, and processes constituting perceptual behavior determine the conditions which must be satisfied by a technique designed to appraise children's social perception. These factors suggest the following criteria:

- a. *The instrument should be based on life-like social situations. Inas-*

much as behavior is a response to a situation, the farther removed that testing situations are from reality the less likely are the results to prove useful in making predictions about the child's behavior in "real" situations. This principle would require the use of life activities or social functions rather than fragmentary episodes or vocabulary exercises. Being more complex and multi-dimensional, the former would also provide more opportunities for perceptual behavior to be manifested.

b. Social situations should be representative of various types of social background. This requirement arises from the fact that the individual's social world is broader than that of his immediate subculture. Ruling out cultural differences in an attempt to arrive at a "common" social background would, moreover, make impossible the study of differentiating factors in society. As our culture becomes increasingly complex, the need for understanding these differences becomes correspondingly greater.

c. Social situations should be structured with respect to the elements involved in social perception. These include such things as the basic social functions, space and time designations used by the perceiver, and attitudes or feelings. Stimuli must be provided for a broad range of categories of these components in order to test for scope of perceptiveness and feelings which constitute the individual's social world.

d. Social situations must contain figures with which children can identify or sympathize. This requirement stems from empirical evidence gained from projective testing which has proved its effectiveness in evoking "personal" data from individuals. The nature of perceptual behavior places a premium on ways and means for eliciting meaningful data.

e. The presentation of social situations should facilitate the expression of perceptual behavior. In order to observe the functioning of selective awareness, many clues must be suggested by the stimulus situation. To enable the subject to project the meaning that these clues have for him as well as his feelings about them, a degree of ambiguity must be introduced in the presentation of life situations. Pictorial media would appear to meet these dual requirements of complexity and ambiguity more satisfactorily than verbal.

2. Social Background

Social background may be conditioned by location, size, and type of community lived in; race or ethnicity, social status, age, and sex. As is indicated in Table 1, a pattern of life-situation pictures has been designed around three of these factors: type of community (rural—urban), social status (upper—lower), and age (child—adult). These were selected be-

cause they are among the most common differentiating factors in our culture, and because they present certain marked contrasts which may have a bearing on social perception. Ethnic clues appear in several life-

TABLE 1
SOCIAL BACKGROUND PATTERNS OF LIFE-SITUATION PICTURE SERIES

Pattern	Type of Situation	Life-Situation Picture	
Community	Environment: Exterior	(Rural)	(Urban)
		Village	City
	Social Function: Production	Farm	Factory
Social Status	Environment: Interior	(Upper)	(Lower)
		Mansion	Hovel
	Social Function: Recreation	Resort	Swimming Hole
Age	Conservation	(Child)	(Adult)
		Bedroom (Human Resources)	Dam (Natural Resources)
	Values	Church (Spiritual)	Capitol (Citizenship)
	Human Relations	Schoolroom (School Relationships)	Dock (World Relationships)

situation pictures, and sex is equated throughout the series to make possible an examination of these factors. Regional comparisons in terms of North, South, East, and West, and the differences associated with the size of community have not been included for reasons mentioned above, and to keep the series within manageable proportions.

A similar plan of organization has been used in designing the Community and Social-Status blocks. For each of the comparative groups, there is a general environmental picture containing a multiplicity of clues and one scene depicting a specific social function. Exterior views in the Community group and interior scenes in the Social-Status pattern are in keeping with the content of these "over-all" stimuli and introduce some variety in their presentation. The social functions of Production and Recreation were selected as being among the most divergent social processes in the culture groups being compared. The remaining block or pattern is thought to be neutral in the sense of community and social-class differences, and highlights experiences associated with age differentials. That the child-adult situations noted in Table 1 are not mutually exclusive is apparent. It can be argued, however, that children deal with home, school, and church relationships to a far greater degree than with conservation of natural resources, government, and world relationships. The three areas of Conservation, Values, and Human Relations, therefore, are common to children and adults and do serve to bring out some very important distinctions. This block consists of six pictures instead of four to increase the number of stimuli bearing on age comparisons, there being no possibility of presenting a "general" child or adult picture containing various stimuli as in the Community and Social-Status patterns.

The above scheme, quite obviously, has attempted to equate the representation of contrasting social backgrounds: rural—urban, upper social status—lower social status, and child—adult. Having classified subjects in these terms, it should be possible to note their perceptiveness to situations typical of their own background as opposed to those drawn from other subcultures but still, presumably, a part of the world with which they must deal in this day and age.

3. *Social Functions*

All people engage in certain basic life activities in order to meet their needs. Table 2 indicates how these social processes have been defined and accounted for in the Life-Situation Picture Series. At least one "theme" picture has been directed toward eight of 10 basic social functions, and additional clues for each function are contained in a number of other pictures. No theme picture was devised for "Communicating" and "Expressing creative and aesthetic impulses." Rather than focus on one type of communication in a single picture, and similarly for creativity, various forms of these processes have been presented in several life situations. One means of transportation, however, was selected to be a "theme" picture. Because the eight

TABLE 2
SOCIAL FUNCTIONS DEPICTED BY LIFE-SITUATION PICTURE SERIES

Social Function	Theme Picture	Clues in Other Pictures
1. Protecting and conserving human resources	Bedroom	<p>Novel - unhygienic living conditions</p> <p>Mansion - wholesome living conditions</p> <p>Church - family group</p> <p>Swimming Hole - hazardous play</p> <p>Capitol - lawmakers, policeman</p> <p>City - traffic policemen, fire escape</p> <p>Dock - family group</p>
2. Protecting and conserving natural resources	Dam	<p>Factory - power lines, raw materials</p> <p>Farm - contour plowing</p>
3. Producing, distributing, and consuming goods and services	Factory Farm Novel Mansion	<p>Dam - farming, water power</p> <p>City - shops</p> <p>Village - store, garden</p>
4. Transporting	Dock	<p>Dam - railroad</p> <p>Factory - automobile</p> <p>Mansion - automobile</p> <p>Church - automobiles</p> <p>Farm - truck, airplane</p> <p>City - bus, automobiles, congested traffic</p> <p>Resort - automobiles</p>
5. Communicating	(None)	<p>Bedroom - radio, telephone</p> <p>Factory - boy selling newspapers</p> <p>Mansion - TV, books, telephone, child reading</p> <p>Farm - rural mail box</p> <p>City - magazine and newspaper stand, TV antennae</p> <p>Schoolroom - telephone, class discussion</p>
6. Governing	Capitol	Dock - immigrants, servicemen, trade, and travel
7. Educating	Schoolroom	Village - school
8. Expressing moral and spiritual values	Church	Village - church
9. Engaging in recreation	Swimming Hole Resort	<p>Dam - fishing</p> <p>Mansion - TV, reading</p> <p>Capitol - tourists</p> <p>City - TV antennae, movie</p> <p>Village - outdoor playing</p> <p>Dock - tourists</p>
10. Expressing creative and aesthetic impulses	(None)	<p>Novel - slum squalor</p> <p>Dam - photographer</p> <p>Factory - industrial grime</p> <p>Mansion - piano, pictures</p> <p>Resort - landscaping</p> <p>Schoolroom - child's picture</p> <p>Village - lawns, gardens</p>

transportation clues contained in other pictures dealt with land and air travel, water transportation was singled out to represent this function. Although the third category, "Producing, distributing, and consuming goods and services," may seem overweighted with four theme pictures, the alternative of dividing this function into its two aspects of (a) production and (b) consumption was rejected in order to maintain consistency in the definitions of social functions.

This discussion indicates the difficulty, if not impossibility, of equating stimuli when complex social situations are involved. As has been demonstrated, a simple "picture per social function" is not the answer. The theme picture for one social function provides supplementary clues for other processes. Moreover, some functions cannot be adequately depicted in one scene. This means, therefore, that an analysis in terms of social functions must be based on the picture series as a whole. It also implies that conclusions regarding the relative sensitivity of individuals to various social functions are not warranted. Another set of pictures might tend to "bring out" a different proportion of responses among the 10 categories. Inasmuch as individuals are confronted with the same stimuli, however, we can compare the perceptiveness of groups to each of the social functions as far as this particular series of life-situations is concerned.

4. *Spatial Setting*

The distribution of life-situation pictures among the various categories which have been set up to designate spatial setting is as follows:

1. Nature—Dam, Farm; Swimming Hole, Resort.
2. Home—Bedroom, Hovel, Mansion.
3. Institution—Church, Capitol, Schoolroom; Dam, Factory, Farm, Resort, Dock.
4. Community—City, Village; Factory (industrial community), Dock (seaport).
5. State—Capitol; Dam, Factory, Farm, City, Village.
6. Region—Dam, Factory, Farm, City, Village.
7. Nation—Capitol; Dam, Factory, Farm, City, Village.
8. World—Dock; Schoolroom.

It is evident that for each of the spatial categories there are a number of pictures stimulating thinking in the area concerned. Priority having been given to the patterning of pictures in terms of social background and social functions, however, the distribution of clues among the various dimensions of space is not uniform. Again, the multi-referential nature of situational stimuli will be noted. To the subjects in this study, five of the 14 pictures

are as appropriate for the State of Wisconsin as they are for the Midwest, and various sections of the United States: Dam, Factory, Farm, City, and Village.

In devising stimuli for the "world" area, consideration had to be given as to whether these situations should be treated as they might be experienced by children and adults living in this country or as they actually exist in the world. The latter position would raise the corollary question of which country or countries would be most representative of "foreign" cultures or "the world." The fact that we are dealing with the world as *American* children see it would seem to imply the need for American settings as the base from which extensions may be made to include world areas. In the same way, life-situation pictures designed for Oriental children to reveal awareness to differences in their social milieu would have to be placed in an Oriental setting. Children of the United States come in contact with the people and cultures of other countries in school; hence, the inclusion of non-Caucasian children in the Schoolroom scene, and suggestion of the UN symbol. American children also know about and experience other countries directly or vicariously through trade, travel, immigrants, and war—which clues have been included in the picture of the Dock.

5. *Temporal Setting*

No attempt has been made to specifically portray periods of the day and year or to indicate past and future time in the Life-Situation Picture Series. Ambiguity with respect to diurnal and annual time categories has been achieved in each of the life situations. The Bedroom scene, for example, could be interpreted as a child who: (a) has just gone to bed *at night*, (b) is about to be awakened *in the morning*, or (c) is taking a nap *in the afternoon*. It could be morning or afternoon; Monday through Friday; fall, winter, or spring for the children in the Schoolroom.

The requirement that stimuli should depict the world as the great majority of American children experience it has limited the possibilities for ambiguity with respect to historical periods. Nevertheless, the Hovel picture might be thought of as the way many people: (a) lived *during the Depression* or (b) live in our slums *today*. In like manner, the Mansion and Village scenes could be transported to the "Old South" or "rural America" respectively. For the most part, however, the presence of telephones, radio, TV, automobiles, airplanes, as well as clothing styles gives the scenes the stamp of the present rather than of past eras. The criterion of reality also ruled out the inclusion of a "futurama" among the series. This by no means

precludes the possibility of taking a modern scene and projecting it into The Future as something to be eliminated (Hovel) or to be achieved by more people (Mansion).

That the picture series provides great latitude for the subject to reveal his sense of time relationships is clear. Because each life-situation can be classified in a number of different time categories, however, the series is not equated in terms of time stimuli.

6. *Children's Figures*

In keeping with the criteria listed previously, each life-situation picture has child and adult figures in it. The distribution of children's figures throughout the series involved a consideration of the following three questions: (a) Should there be one or several children's figures in each life-situation? (b) Should the sex factor be equated in each picture or throughout the series as a whole? (c) Should the sex figure be delineated clearly or ambiguously?

The resolution of these questions is indicated in Table 3, and includes all the alternatives listed above to the end that their effects may be analyzed. Somewhat greater weight has been given to the presentation of several children's figures in a life situation which are not clearly defined and, therefore, emphasize neither sex. In only four of the 14 pictures has the sex factor been "slanted" but even here there are other children—or background figures which might be taken for children—with whom the respondee can empathize. These four pictures: Factory, Capitol, Dock, and Hovel highlight children's figures because they were deemed the most difficult for the majority of elementary school children to interpret. It was felt that the unmistakable presence of a child figure might assist in the process of identification and consequent understanding of the life situation.

Thus, the sex variable has been equated between boys and girls within each type of figure presentation and for the series as a whole. It should, therefore, be possible to determine whether differences in responses are related to the type of figure portrayal employed in specific pictures as well as analyze responses to the entire series.

7. *Description of the Life-Situation Picture Series*

For the reader who is interested in knowing more about the life-situation pictures than their names, the following thumb-nail descriptions are offered.

Picture No. 1—Bedroom. In the foreground, a child is lying in bed. The room is simply furnished. Through the open door a shadowy figure may be seen.

Picture No. 2—Hovel. A woman holding a baby in her arms is seated at a table in the center of the picture. Beside her stands a girl, and a third child is lying in bed. A man is standing at the door. All the people look disheveled; the room and its furnishings are in extremely poor condition. There are many other evidences of poverty.

Picture No. 3—Dam. A dam and reservoir are in the center. The land on the left is well tended and prosperous while the other side is eroded and barren. A man is looking through something on a tripod, and a child is near the spillway.

TABLE 3
CHILDREN'S FIGURES IN THE LIFE-SITUATION PICTURE SERIES

Number of Children in Picture	One Sex Emphasized	Neither Sex Emphasized	
	Sex Clearly Defined	Sex Clearly Defined	Sex Ambiguous
One	Factory - boy in foreground Capitol - girl in foreground		Bedroom - child in foreground Mansion - child in foreground Dam - child in midground Farm - child in midground
Several	Dock - boy predominant in foreground Hovel - girl predominant in foreground	Church - boys and girls in foreground Schoolroom - boys and girls in foreground	Swimming Hole - children throughout Resort - children throughout City - children throughout Village - children throughout

Picture No. 4—Factory. The background consists of buildings, tall chimneys, storage tanks, and high power lines. Men and women in the foreground are walking towards the factory preceded by an expensive-looking automobile going down the drive. There is a boy in the foreground with something under his arm.

Picture No. 5—Mansion. A maid is helping a woman with her cape while a man is standing in the doorway. Sitting on a modern sofa to the left, a child is looking at a newspaper. Through a large picture window may be seen a man standing next to an automobile. There are many evidences of luxury.

Picture No. 6—Church. There are two buildings on opposite street corners, one of which bears the sign of the cross. Both entrances are crowded with people. A man, woman, and three children in the foreground are walking across the street toward one of the buildings.

Picture No. 7—Farm. In the foreground a man is driving a tractor. Across the road are farm buildings, animals, and more fields. A child is approaching the mailbox. A huge truck is driving toward a small town off in the distance.

Picture No. 8—Swimming Hole. Many children are playing and swimming around a dilapidated pier at the water's edge. Some have built a fire; others appear to be fighting. At the right may be seen one end of a broken-down building.

Picture No. 9—Capitol. The background is a building resembling the nation's capitol, in front of which many people are gathered. Most prominent are two men with briefcases, a woman and a girl, and a policeman.

Picture No. 10—City. This scene of a busy street corner depicts many different types of stores and a theater. The sidewalks are crowded with people of all ages, and the streets are congested with traffic. There is a newstand, a signal light, and policeman.

Picture No. 11—Resort. One end of a building appears on the left in front of which there is a modern swimming pool, and to the side are some tennis courts. On the right are the riding stables, golf course, and parking area with "big" cars. Children and adults are engaged in various activities.

Picture No. 12—Schoolroom. Boys and girls representing a mixture of races are grouped around a table listening to a pupil who is holding a picture. The teacher is sitting off to one side observing the children. There is a blackboard, poster suggesting the UN, and a telephone.

Picture No. 13—Village. The road entering a small village is lined on either side with houses, a general store, school, and a church. Children and adults are working about their homes, walking down the road, or playing.

Picture No. 14—Dock. A large ship to the left is crowded with people and one to the right is being loaded with cargo. The pier is congested with crates and people, among whom are foreigners and servicemen. In the foreground, a man with a baby in his arms is talking to a woman while a boy looks on.

D. SOCIAL PERCEPTION INTERVIEW

The complex nature of the content and processes involved in social perception give rise to four questions regarding the procedure to be followed in administering the Life-Situation Picture Series: (a) What tasks should the subject perform in order to reveal his perception of social situations? (b) In what order should the life-situation pictures be presented?

(c) How can extraneous influences be reduced to a minimum? (d) How can pupils be motivated to engage in these tasks meaningfully?

1. *Evoking Perceptual Behavior*

To study a complex of behaviors involving the selection of things to which one attends, the meaning given to these referents, and feelings one may have about them, would seem to call for a relatively unstructured technique giving the individual considerable latitude to report in his own fashion. Any so-called objective approach would be more suggestive regarding the things to which one should pay attention, and would offer a narrower range of possibilities for responding to the situation.

Experience with projective testing has revealed that the dramatic story in response to an ambiguous stimulus is an effective technique for eliciting personal data which may not otherwise be forthcoming. Its use has usually been combined with some type of follow-up inquiry for the purpose of clarifying obscure points in the story, to secure additional data, or to test the limits of the individual's insights or feelings.

In a previous study (+) the writer corroborated the need for some kind of follow-up when using unstructured techniques with young children. Ten- and 11-year-olds did not respond at great length to one directive, and other means had to be devised to yield adequate data for analysis. The approach, termed a "focussed interview," was based on the progressive structuring of the questions. Beginning with relatively unstructured questions: "What do you see in this picture?" the interview gradually circumscribed the area of choice in reacting to the situation until at the end, both the topic and mode of response were controlled, viz. "How many people in (community) live like this?

- a. Hardly anybody?
- b. Almost everybody?
- c. About half the people?
- d. Less than half the people?
- e. More than half the people?

This approach is suitable for the consideration of one social situation representing a number of different facets. It would not be suitable for a series of pictures because of the length of time involved, and because the subject's responses to succeeding situations might be conditioned after having gone through the cycle of questions the first time.

The procedure used in this study is based on the principle of *increasing involvement*. It calls for repeated exposures to the Life-Situation Picture

Series in the performance of different tasks under different conditions. The involvement gradient proceeds from behavior which is characterized by: (a) spontaneous reactions to the life situations to (b) making and supporting decisions about these life situations, and finally, to (c) making and sup-

TABLE 4
INVOLVEMENT GRADIENT IN THREE PHASES OF SOCIAL PERCEPTION INTERVIEW

	Part I	Part II	Part III
Task	To produce a story about each picture.	To select children's figures for each picture.	To designate the 3 preferred and 1 non-preferred pictures.
Stimulus	Projection of 2" x 2" black and white slides of Life-Situation Picture Series on 30" x 40" screen.	1. 8½" x 11" photostatic copies of Life-Situation Picture Series. 2. 6" cardboard cutout figures of 4 boys and 4 girls (happy, sad, angry, and neutral).	1. 8½" x 11" composite picture of Life-Situation Picture Series.
Directive	"What story does this picture tell?" (Repeat for each picture).	1. "Which boy or girl belongs in this picture?" 2. "Why?" (Repeat for each picture)	1. Which picture would you like to keep for yourself? 2. "Why?" (Repeat in modified form twice more and then in negative sense.)
Behavior	Producing a story spontaneously.	Making and supporting decisions.	Making and supporting decisions affecting the subject.

porting decisions about the life situations which are of some import to the subject. How differences in tasks, conditions, and involvement level have been accommodated in the three phases of administering this instrument is indicated in Table 4.

In Part I, the subject is free to make up any "story" he wishes regarding the life-situation pictures as they are projected on a screen one at a time. Under such permissive circumstances, the subject is likely to acquire confidence in the interview situation while being oriented to the Life-Situation Picture Series. In Part II, he is presented with photostatic copies of the same life situations and after selecting from among eight cardboard figures

of happy, sad, angry, and neutral boys and girls, the one which "belongs" in each picture, he tells why the figure belongs in the picture. The expectation for this part is that additional information will be educed including a more definite expression of attitudes and values. In Part III, the subject selects and keeps the three life-situation pictures he likes best, and indicates the one least preferred, giving reasons for his four choices. A composite picture of the series aids in making selections by enabling him to see all life-situation pictures at one time. This phase may be considered to be the testing of limits with special reference to attitudes and values.

Data obtained in this study give evidence of the tendency toward increasing involvement as subjects move through the interview procedures. The responses of a sixth grade rural boy of average intelligence to the Schoolroom picture are as follows:

Part I: *What story does this picture tell?*²

That tells of a second grade schoolroom a class reading and some of them are doing arithmetic and some are standing around and some of the other people are reading and drawing and stuff like that . . . they're reading and some of them are doing arithmetic and some are drawing and some are sitting around the table and some are standing that's about all.

Part II: *Which boy or girl belongs in this picture?*

The in-between boy and girl.

Why?

Because there's a girls and boys sitting around the table reading and writing and well . . . I wouldn't say they're happy boys and I wouldn't say they're sad boys just doing their work.

Part III: *Which picture wouldn't you want to keep?*

(Subject points to schoolroom picture.)

Why?

'Cause I don't like school very well.

A more precise determination of involvement as subjects proceed from Part I through Part III of the interview is to analyze their attitudes. Greater involvement would be revealed if the proportion of attitudinal expressions (either positive or negative) increased or, conversely, if the proportion of neutral responses decreased. Figure 1 presents the percentage of neutral responses given in the picture stores (Part I), the reasons given for the figures selected in Part II, and reasons given for picture preferences

²All protocols are exactly as transcribed from the tape recording. To eliminate the possibility of interpretation by the typist, no attempt has been made to delineate thought units by means of punctuation.

in Part III. Almost four out of five picture stories were classified as neutral whereas reasons given for the four picture preferences were, with few exceptions, definitely attitudinal. A more direct comparison can be made between the percentage of neutral responses in Parts I and II, each of which involves reactions to all fourteen pictures in the series. The Critical Ratio

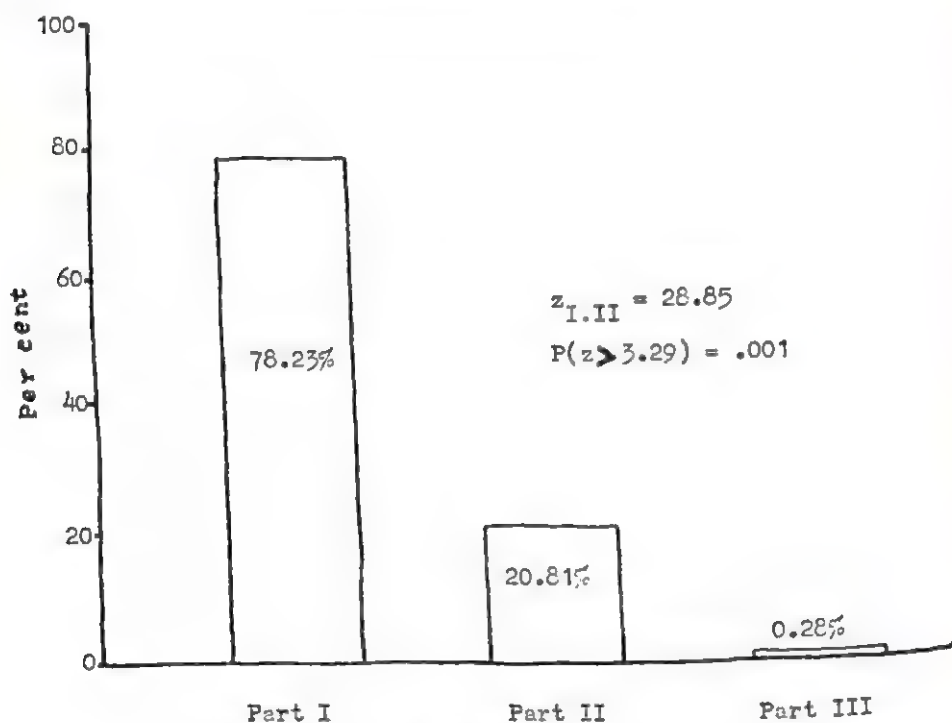


FIGURE 1
NEUTRAL RESPONSES GIVEN BY COMBINED SUBGROUPS IN PARTS I, II, AND III OF
SOCIAL PERCEPTION INTERVIEW

of the difference (z) establishes a very high level of confidence for regarding this difference as real rather than due to chance factors.

2. Order of Presentation

There is some evidence that the position of a stimulus within a series may have some bearing on the response made to it. Children may cross-reference their remarks by replying, "Like I said in the other picture . . .". For group comparisons this factor can be eliminated by presenting the series in random order to each individual or by systematically rotating the pictures through all the positions of the series. Such procedures, however, are not

useful for individual diagnosis for which reason this factor has been kept constant rather than eliminated by designating a standard sequence for the presentation of the Life-Situation Picture Series.

The basis on which the order was determined is indicated in Table 5, the movement being from left to right and down the three social-background patterns. In this way, social situations from each pattern are found at every point in the series, and no two pictures from the same block are adjacent

TABLE 5
ORDER OF PRESENTATION OF LIFE-SITUATION PICTURE SERIES

Social Background Pattern					
Social Status		Age		Community	
No.	Picture	No.	Picture	No.	Picture
	_____	1	Bedroom		_____
2	Hovel	3	Dam	4	Factory
5	Mansion	6	Church	7	Farm
8	Swim. Hole	9	Capitol	10	City
11	Resort	12	Schoolroom	13	Village
	_____	14	Dock		_____

to each other. Furthermore, the series begins with a relatively simple situation close to children and ends on one which is more complex and distant.

One test of this sequence is found in measures of productivity. A high relationship between the order in which pictures are presented and the magnitude of such measures would raise the question as to whether productivity is merely a reflection of some positional factor. Table 6 presents the correlations between picture order and several measures of productivity for the total group of 88 children included in this study. There appears to be no significant relationship between the placement of a picture in the series and the number of seconds that pupils attended to it or the number of words which made up their free-association response in Part I. If Attention Time and Word Productivity may be regarded as indices of interest and effort, there is reason to believe that these motivational factors are not being systematically influenced by the order in which pictures are presented. Similarly, there is no relationship between the inclination to ascribe space and

time dimensions to a picture stimulus and its position in the series. Spatial and temporal settings are ideational in character, and, thus, some evidence is provided to the effect that the order of picture presentation is not associated with systematic differences in the content of children's responses.

TABLE 6
RELATIONSHIP BETWEEN ORDER OF PICTURE PRESENTATION AND MEASURES OF PRODUCTIVITY

Measure	Rho
1. Attention time	.319
2. Word productivity	— .147
3. Spatial setting	— .403
4. Temporal setting	.285

3. *Reducing Extraneous Factors*

The influence of test conditions upon test results appears to be related to the subtleness of the qualities being appraised and the age of the subjects being studied. Distractions are less likely to bias measurements of height and weight than scores on a reading test. Complicated instructions for a test are more likely to interfere with the performance of young children than of older subjects. In a study of children's social perception, therefore, great care must be given to the circumstances under which data are obtained, because distortions of perceptual behavior can be induced so readily.

A test which is administered individually is likely to have greater possibilities of control over extraneous factors than one which is given in a group situation. Compared with group procedures, individual testing places fewer restrictions on the ways in which the stimulus can be presented and the subject may respond. In Part II of the social-perception interview, for example, it is possible for subjects to become thoroughly acquainted with the cardboard figures depicting various emotions, and to indicate their responses through the manipulation of these figures rather than being restricted to the use of verbal symbols—an important consideration for first-grade children. An individual approach, obviously, frees the subject from group distractions and suggestibility. The close working relationship of the subject and interviewer makes possible the continuing development of rapport and coöperation. Directions are more likely to be understood by the subject because the instructional period can be geared to his needs, questions may be asked whenever there is doubt, and the individual is constantly under the supervision of the interviewer. Likewise, it is possible to meet varying requirements regarding the length of time required for each stimulus presentation and the general pacing of the interview.

Individual procedures, it must be recognized, are not without limitations. They are extremely time consuming, and for the same expenditure of time and effort produce a marked limitation in size of sampling as compared to group procedures. The need for probing with utmost sensitivity into the area of children's perceptions would justify such costly procedures. Second, there is always the possibility that some subjects might feel freer to respond if they were "lost in a crowd," so to speak, rather than under the direct scrutiny of the interviewer. To counteract this possibility are certain motivational factors which will be discussed in the next section. Lastly, there is always the danger that the interviewer will inadvertently suggest responses to the subject or vary his procedures. For this reason, the administration of the Life-Situation Picture Series has been standardized. Comments which may be given by the interviewer in reply to the subject's inquiries, although supportive and clarifying the point in question, should not be "leading" with respect to perceptual behavior.

Communication is another factor causing distortion when securing data about pupil behavior. Reading and writing are not only difficult for young children, they tend to inhibit spontaneity of expression which is so productive of phenomenological material. Whether note-taking by the interviewer is adequate depends upon the purposes of the test and the refinement of the measuring units being employed. In the writer's earlier study of children's awareness of poverty, for example, note-taking accounted for 95 per cent of the ideas contained in typescripts of mechanical recordings. This discrepancy did not affect the awareness scores, because the omissions were largely duplications or material outside the scope of the study. An analysis on the broad front of perceptual behavior, however, would require more accurate data than the smooth versions obtained by note-taking. A tape recorder was, therefore, used in this study, and typescripts prepared by the secretary were checked against the tape recordings by another person to insure a high degree of accuracy. No claim can be made for perfection, however, due to barely inaudible remarks and poor enunciation on the part of the subject as well as background noises which occasionally interfered with reception. Not only does it result in a more accurate record, but the use of a mechanical recorder also frees the interviewer from a very exacting chore during the administration of the instrument enabling him to concentrate on more important matters. This gain, it must be admitted, is offset by the labor required to type the protocols off the recorder, but this comes afterwards and not at the expense of introducing distractions into the interview itself. The effect of mechanical recorders versus note-taking upon pupil responsive-

ness is a moot question except when the former is concealed or made inconspicuous. In most cases it was possible to place the tape recorder behind the subject among other supplies and equipment used in the study. The microphone, secured in a sound-proof box open at one end, was placed on a card table off to one side. The machine was operated by a remote control switch, and once started it required no attention for none of the interviews exceeded the limit of one hour's recording.

A third factor which may influence the kind of personal data evoked in an interview is the interviewer himself. Adults vary in the degree of rapport they can establish with children at a first meeting. For a large survey, it would be necessary to rotate the interviewers among the various groups to cancel out this effect. In the present study, interviewer influence was kept constant by having one person conduct all the interviews, and by sampling the various subgroups in approximately equal proportions over time so that whatever changes occurred in the interviewer, if any, would be equalized.

This technique of proportionate sampling was important for another reason. It is quite possible that perception, at least from the standpoint of what one attends to, may be influenced by weather or conditions in general. By sampling groups proportionately over the four-month period which included the winter and spring seasons, these effects have been distributed more or less equally among the subgroups constituting the sample.

4. *Motivating Subjects*

That a relationship exists between test motivation and test results has been generally accepted (3). If attitude can influence performance on academic and "objective" examinations, how much more could it effect responses in a relatively unstructured testing situation? For in the latter, the expectation is that the subject will "project" himself into the situation and so reveal his private world. If, because of a lack of motivation or for other reasons, the subject fails to become personally involved his responses will be superficial at best. Significant as this form of avoidance behavior may be in the study of personality, it offers little data for the analysis of social perception. Hence, the great premium placed on motivational factors in this study.

To be consistent with the principles of perceptual behavior, the first and foremost consideration at every step in the proceedings was to provide meaning for the things which the subject was asked to do. At the very outset, pupils were informed that this was not "school work," but that the inter-

viewer required the help of boys and girls in order to improve the quality of books and other programs being developed for children. In this context, the various tasks could be logically "explained" by the interviewer and "perceived" as sensible requests by the subject. To preserve the meaningfulness built into the procedures and to avoid the feeling that this was "something to get over with so that we can . . .," conferences were held with the teacher or principal beforehand to explain the general nature of the project and to avoid conflicts with classroom and individual activities of high priority and interest.

One of the most important steps in the development of motivation consisted of a group orientation period during which time: (a) the purpose of the visit was made known, (b) the suitability of pictorial stimuli for the presentation of ideas was demonstrated, and (c) children and interviewer came to know each other. Each pupil was given paper and crayons so that he could "show" what he was interested in. When his drawing was finished, he took it to the interviewer and told her the "story" about his picture. This was written on the back by the interviewer so that she would "remember." When everyone had finished, the interviewer showed all the drawings to the class, reading the comments on the pictures, and sometimes having the children add to their "stories." As a result of this group meeting, the interviewer moved from the status of an outsider to that of an accepted group leader, and established a face-to-face relationship with the child who had previously been selected for the social perception interview which was enthusiastically followed. In the great majority of cases, the subject's hand was enthusiastically raised in response to the interviewer's final request for "someone to help in another way."

The "practice" picture which served as an introduction to the Life-Situation Picture Series also had certain motivational possibilities. Not only did it give the subject an opportunity to "warm up," but it could engender a certain kind of security in the proceedings. The experience should have given him some confidence in his ability to cope with the subject-matter of the pictures as well as their form of presentation. The fact that the interviewer encouraged him to seek a number of different "stories" to the picture should have impressed him with the realization that his task was not to guess the correct answer but to make any interpretation that seemed reasonable to him. Furthermore, he was given the satisfaction of knowing that he was following directions correctly. Parenthetically, it should be stated that this experience also provided the interviewer with certain securities. She could check on the subject's understanding of directions as well as on

her equipment and procedures without jeopardizing the results of the first picture in the series.

In keeping with the request-for-aid point of view, a permissive atmosphere was maintained throughout the individual interviews. The subject's responses were accepted without question; the interviewer's comments being confined to requests for further clarification and to supportive remarks. Part I set the stage immediately in this respect. With his back to the interviewer and the room dimly lit, the subject's self-consciousness was lessened. Because he was being exposed to each life situation three times, there was no need to insist upon a response for each stimulus presentation. "I don't know anything for this one" was received without any show of concern by the interviewer. Neither was there any need for strict conformity to directions in Parts II and III. If the subject preferred to include both a boy and a girl in his figure selection instead of only one or indicated more or fewer picture preferences than requested, no notice was taken, because he was still providing the interviewer with the kind of data for which the study was designed. In short, at no point in the proceedings was the subject placed in the position where he had to admit ignorance or try to guess "the answer."

Variety was introduced into the procedures as a means of maintaining a high interest level. This was achieved with respect to *both* the tasks to be performed and the mode of stimulus presentation as was indicated in Table 4. The decision to begin with the projection of 2" x 2" slides was prompted by the realization that this form of presentation has high motivational qualities for young children, and captures attention if for no other reason that there is little else to concentrate on in a darkened room.

The spacing of the various phases in the administration of the Life-Situation Picture Series was also calculated to prevent fatigue. Generally speaking, Part I took more time than Part II, and Part III was invariably the shortest. Instructional periods between the various parts of the test also served as "breaks." Between Parts I and II, for example, the pupil was given an opportunity to move about when requested to turn on the lights and to change his seating from the projector to a small table. In no case did the total time for the interview exceed one hour—a limit arbitrarily imposed by the tape recorder.

Reward was used as a motivating factor in Part III. It is reasonable to assume that when the subject knows he may keep the pictures designated as his preferences, he will make his selections more carefully. There could be some question regarding the value that these pictures held for some of the

children, but little doubt regarding their recognition of this gesture as a token of the interviewer's appreciation for their assistance. A logical culmination was thus achieved and the interview ended on a high note for both subject and examiner.

One measure of motivation, when no pressure is brought to bear on individuals, is to note the number of times they respond to stimuli. The data in Table 7 indicate that a reply of "I don't know" or words to that effect was given to 1.48 per cent of the 4,400 directives given to the subjects in the study being reported. In itself, a response level of 98.52 per cent speaks for a high degree of subject coöperation. Analysis of the 65 instances when

TABLE 7
FREQUENCY WITH WHICH NO RESPONSE WAS GIVEN TO DIRECTIVES IN VARIOUS PHASES OF SOCIAL PERCEPTION INTERVIEW

Group	Picture story	Figure selection		Picture preference		Total
		Figure	Reason	Picture	Reason	
High IQ (<i>N</i> = 16)	0	1	4	0	2	7
Middle IQ (<i>N</i> = 56)	6	2	10	1	7	26
Low IQ (<i>N</i> = 16)	4	0	26	1	1	32
Total no response	10	3	40	2	10	65
Total responses	1,222	1,229	1,192	350	342	4,335
Total directives	1,232	1,232	1,232	352	352	4,400
Per cent no response	0.81%	0.24%	3.25%	0.57%	2.84%	1.48%

no reply was forthcoming offers some clues to explain this type of behavior. The distribution of these lack of responses among the five directives is not due to chance, and does not reveal a trend which might be associated with increasing or flagging interest. With respect to the three intelligence groups, however, there is a significant weighting produced by the frequency with which subjects of low intelligence failed to respond. To this must be added that 60 of the 65 "no responses" were attributed to first graders and only five to the sixth grade group. There is substantial evidence, therefore, to support the position that when a child said "I don't know" his statement might be a reflection of immaturity and lack of knowledge as well as an uncoöperative attitude or evasion. The fact that in only two of the 1,232 picture summaries (a first grade urban boy's reactions to the City and Village scenes) were no data elicited by all five directives for a picture, would seem to indicate that whatever the factor, it did not (or could not) operate consistently throughout the interview—or that the subject used means other than non-productivity to conceal his true feelings.

E. A CASE DESCRIPTION

To illustrate its movement and dynamic quality, an account will be given of the complete data-gathering process. The setting is a one-room rural school with all pupils, grades one through eight, participating in the group orientation. The subject selected for the social perception interview was a sixth grade girl, 11 years and 6 months of age, who was born and lives on a farm. Exactly one week after this visit, the Stanford-Binet Intelligence Test (Form L) was administered by another examiner, and she was found to be low-average. The group orientation is reported in anecdotal form; except for minor changes, the individual interview is presented as tape-recorded.

1. *Group Orientation*

When the interviewer arrived, she was introduced by the teacher, and given complete charge of the group. The interviewer began by saying:

We are visiting many of the schools in Wisconsin. We're visiting them because we need help, and boys and girls like to help us. (Teacher) said that you would like to help us, too. Now, let me tell you the kind of help we need. We are interested in books and programs for boys and girls so we would like to know what boys and girls are interested in. An easy way for you to show me this would be to draw a picture. It can be any kind of picture you want to draw for me. Remember it can be anything you are interested in or think about.

While the 12" by 18" sheets of white construction paper and boxes of eight crayons were being distributed by pupils, the interviewer repeated the idea of "drawing anything you are interested in or think about." Many children started out as soon as they received their materials; some sat and thought a while.

The interviewer walked around the room once to give children an opportunity to ask questions in a face-to-face relationship. One pupil said, "I don't know what to draw. I'm interested in lots of things." To this the interviewer replied, "Yes, I know. Now, what would you like to show me? You think about it and when you are ready, make your drawing." Another pupil asked, "Can we draw anything?" The interviewer replied, "Yes, when you walk to school or when you are alone you think about all sorts of things. You could show me something that you think about or are interested in. You can draw anything that you want to." All comments made by the interviewer were attempts to be encouraging, but stated in such a manner that the decisions made by the child of what he should draw and how he would draw it were his own.

By the time the interviewer had gone around the classroom, almost all pupils were working; those who were not soon started. The children exhibited interest and pleasure in making their drawings; there were no problems of coöperation or discipline. The teacher continued working at her desk and the interviewer remained in the back of the room so as not to influence the drawings.

After the children had worked for some time, the interviewer gave the following directions:

When you are finished with your picture, please put your name, age, grade, and the name of your school on the back of your paper. (Writes these on the blackboard to help the children remember.) Then, I would like you to bring your drawing to me so that I can check to see that these are on your paper, and so that I can talk to you a little and get to know you.

On finishing his drawing, a pupil took it to the interviewer who asked, "What would you like me to know about your drawing?" The child's "story" was written on the back with the comment, "I'm going to write it down so that I won't forget it." One child said, "Oh! I don't know, it's just a picture," to which the interviewer replied, "I like it very much. What would you like me to remember about your picture? Can you tell me about it?" She reassured another child by saying, "All the boys and girls are telling me about their pictures so that I will remember." Pupils were not questioned specifically about what was in their pictures, but were encouraged by such remarks as: "Oh! I like that; tell me about it," "that makes a good story," or "that's very interesting."

When all the drawings had been given her, the interviewer went to the front of the room to show them to the teacher and the class. She said: "I think you would be interested in seeing all the pictures made by the boys and girls in your class, and in hearing the stories about them. You watch for the interesting ideas they have." The interviewer presented the pictures one at a time, and read the comments on the back. The children contributed ideas about the pictures and their classmates' interests during this sharing period. When all the pictures had been shown, the interviewer concluded:

Now I'd like someone to help me in another way. I have some pictures drawn by somebody else. I'd like to know what you think about them. I'm going to show them like movies, so we will go out in the hall to see them. Let me see who I can choose to help me . . . (Pupil), would you like to come and tell me about these pictures? (Subject had been selected at random beforehand.)

The interviewer thanked the class and the teacher for their coöperation and left with the pupil who was obviously pleased for having been chosen. In all, it had taken approximately one and one-half hours for this group orientation period. Judging by the children's expressions, it had been a very enjoyable experience, and the interviewer succeeded in gaining rapport with the subject whose reactions to the Life-Situation Picture Series were to be obtained next.

2. *Social Perception Interview*

On entering the semi-dark room, the interviewer motioned the subject to sit down in a chair placed beside the slide projector while she sat down behind the machine. First, she turned on the projector and the tape recorder, the latter by means of a remote control foot switch. The tape recorder was placed off to one side partially concealed by equipment, and the microphone, in its sound-proof shield, stood inconspicuously on a near-by table. The interview proceeded as follows:

Part I

I: (Subject), remember how you drew a picture and then told me a story to put on the back of your picture? Now these are the pictures that someone else drew, and I'd like you to tell me a story about them. This is the kind of picture they will be. (Projects the practice picture of a man, woman, boy, and girl sitting around a table, filling the 30" x 40" screen.) Can you tell me a story about this one?

S: Well, what are they doing, first of all?

I: What do you think? You tell me about the picture. What story does the picture tell?

S: Well it looks like they're eating or something.

I: UmHum.

S: No, I mean they look like they're praying—just about ready to begin to eat.

I: How do you know they're doing this in the picture?

S: Because their heads are bowed something like, and the man's got his hands folded.

I: And who do you think is in the picture?

S: Looks like a family-like.

I: You tell very good stories, (Subject). Now, I'm going to show you the pictures like this, one at a time, and I'm going to ask you to tell a story about each picture. When you are all finished with your story, say "that's all," and I will show you the next one. Do you understand what we are going to do?

S: UmHum. O. K.

I: All right. Here is Picture No. 1 (Bedroom). What story does this picture tell, (Subject)? (Begins timing response with a stop watch.)

S: Well, it looks like the little girl is laying down about no well it

looks like a little girl is laying down at night about 9:00 and she's sleeping and the door's wide open and it looks like there's just a little bit of a shadow by the door like like somebody's standing there I think that's all I see.

I: (Records length of response in seconds.) This is Picture No. 2 (Hovel). What story does this picture tell?

S: Well it looks like a very poor family and the man's the father and the little boy it looks like he's sick the little boy and the mother's holding a little child it looks like he's just born and the little girl is helping her mother do some of the work that's all I see.

I: And Picture No. 3 (Dam). What story does this picture tell?

S: It looks like a far—a boy he's gonna fish down at the lake and the farmer's gonna take a picture of a the boy gonna start in ta fish it looks like there's there's a lotta mountains and there's a dam there and there's a field of corn I think down there that's all I can see.

I: And Picture No. 4 (Factory). What story does this picture tell?

S: Um it looks like it's some kind of a town or factory and everybody's around there looking at it around there there's a car looks like somebody's in the car and a there's a kind of a crowd around like there's something new or something around there that's all.

I: Picture No. 5 (Mansion). What story does this picture tell?

S: Well it looks like a very rich family in the olden days and they're gittin' ready for a party or going out to a party and there's a maid fixing up the a woman and the little girl she's sitting on the great big couch and there's a piano that they play there and the man looks like he's got a couple medals on in a way just ready to leave in his car outside it looks like a man is going to drive him there that's all I can see.

I: And Picture No. 6 (Church). What story does this picture tell?

S: Well it looks like it's on a Sunday and all the families in the town are gittin' ready to go to church or coming out of church and there's like a reunion or somethin' they all git together on Sunday like that's all I can see.

I: And Picture No. 7 (Farm). What story does this picture tell?

S: Well it looks like a farmer out in the fields working in the fields on a farm and there's airplane going over the farm and there's a lot of animals and a house and a barn that's all I can see.

I: You tell very good stories, (Subject). This is Picture No. 8 (Swimming Hole). What story does this picture tell?

S: It looks like it's at a seashore and a they're gettin' ready to swim in the swimming pool and peo—some people are in the water and a lot of people are running around having a good time that's all.

I: Picture No. 9 (Capitol). What story does this picture tell?

S: Well it looks it's in a great big city and there's a couple businessmen around and there are a lot of people there they're looking at the Capitol or some looks something like the Capitol in Madison that every-

body's looking at it and there's a lot of people talking to each other that's all I can see.

I: And Picture No. 10 (City). What story does this picture tell?

S: Well it looks like it's downtown and there's a lot of people walking around there's a policeman at the corner of a house a the corner of the street and there's a lotta cars moving back and forth and there's a bus there and a well that's all I can see, I think.

I: This is Picture No. 11 (Resort). What story does this picture tell?

S: Well it looks like looks like it's at a some kind of a home or some place where people rest not rest but have a have a vacation like and they're all around there and got horses to ride a couple of cars around and some men are going to a golf course and then there's a woman just getting a suntan and one's just ready to dive into the water that's all I can see.

I: And Picture No. 12 (Schoolroom). What story does this picture tell?

S: Well it looks like like it's in a library or a school and they're a teacher's watching 'em watching over them to see what they're doing and it looks like a girl's telling a story to the boys and girls that she's read and there's a couple problems on the blackboard that's all I can tell.

I: Picture No. 13 (Village). (Subject), what story does this picture tell?

S: It looks like it's a town in the olden days something like and there's a man he's carrying something out of his house and there's a lotta boys there's some boys and girls playing around and there's some people in the side of the road and that's all I can see on that one.

I: And Picture No. 14 (Dock). What story does this picture tell?

S: Well it looks like it's at a some place dock where people are ready to out go out some place on the boat and people are coming back and there's a lotta men and women a there's a woman there she's a seeing a her husband and she hasn't talked with him for a long time and there a there and he's holding their baby I guess and talking a long time and then there's other people there that a they haven't seen for a long time and they're greeting them and there's some people that are jist gettin' ready to go off a on the ship that's all.

I: Very good, (Subject). Will you turn on the lights by the door, please?

Part II

I: Now, if you will just turn your chair around, I'll bring mine over here so we can both sit at this table. I've got something else that I would like you to help me with. (Opens a folder on the table containing some materials.) These are the pictures that you have just seen, (Subject), the very same ones, only they are photographs. And here are some pictures of boys and girls. This is a very happy little girl.

You know she is happy because she is smiling. Here is a sad little girl; she is crying. And here is a very angry little girl. You can tell she's angry because she is frowning. And this little girl we call a little in-between girl because she's not happy, she's not sad, and she's not angry. She's just so-so.

I: And which boy do you think this is?

S: The happy one.

I: How can you tell?

S: He's smiling.

I: And which boy is this?

S: He's sad 'cause he's crying.

I: Which one is this?

S: That's the cross boy he looks mad.

I: Which boy is this?

S: The one that isn't sad or happy or mad . . . the in-between boy.

I: So we have happy people, sad people, angry people, and in-between people. (Arranges cardboard figures in the following pattern):

happy boy		sad girl		angry boy		neutral girl
happy girl		sad boy		angry girl		neutral boy

I: Now, (Subject), I would like you to look at each picture and tell me which boy or girl you think belongs in the picture. (Places the life-situation pictures in a pile before the subject, No. 1 on top.) This is Picture No. 1 (Bedroom). Which boy or girl belongs in this picture?

S: The in-between girl.

I: Why?

S: Because she isn't a happy she isn't mad or she isn't crying she's just laying down peacefully like.

I: (Takes top picture off the pile and turns it face down on the table thus revealing the next picture.) This is Picture No. 2 (Hovel). Which boy or girl belongs in this picture?

S: The sad boy.

I: Why?

S: Because he doesn't look like he's very happy it looks like he's kinda sick or something and he's not very happy about it.

I: And Picture No. 3 (Dam). Which boy or girl belongs in this picture?

S: The happy boy.

I: Why?

S: Because he's happy because he's gonna go fishing.

I: Picture No. 4 (Factory). Which boy or girl belongs in this picture?

S: The in-between boy.

I: Why?

S: 'Cause he a isn't happy or sad or mad or anything he's just selling papers like a normal boy would.

I: This is Picture No. 5 (Mansion). Which boy or girl belongs in this picture?

S: The in-between girl.

I: Why?

S: She a isn't happy a she's just looking at a paper she's kinda peacefully like too.

I: Picture No. 6 (Church). Which boy or girl belongs in this picture?

S: The in-between boy and girl.

I: Why?

S: Well because the boy he's just walking to a church he isn't happy or anything and the little girl she's just in-between because she's just walking to church like any girl would.

I: Picture No. 7 (Farm). Which boy or girl belongs in this picture?

S: A happy boy 'cause he looks like he's like he's whistling and very happy going to the mail box or carrying something out to his father or something like that.

(Obviously, there is no need to ask "Why?")

I: And Picture No. 8 (Swimming Hole). Which boy or girl belongs in this picture?

S: The angry boy.

I: Why?

S: Like he's a kinda angry at somebody . . . he's chasing another boy that it looks like he hit him or something.

I: Picture No. 9 (Capitol). Which boy or girl belongs in this picture?

S: The happy girl 'cause she looks kinda happy 'cause she's seein' this building like that she's never saw before and she's happy a because she can see it.

I: And Picture No. 10 (City). Which boy or girl belongs in this picture?

S: The happy boy and girl because they're downtown and every girl and boy likes to go downtown with their mother because well they like to buy things and see things in town.

I: Picture No. 11 (Resort). Which boy or girl belongs in this picture?

S: The happy boy and girl.

I: Why?

S: Because they look all very happy and because um well there's so many things to do around there and it looks like they're all kinda happy 'cause it looks like they're all playing.

I: Picture No. 12 (Schoolroom). Which boy or girl belongs in this picture?

S: The in-between girl.

I: Why?

S: I think she'd be in-between 'cause she's just telling a story to some kids.

I: Picture No. 13 (Village). Which boy or girl belongs in this picture?

S: The in-between boy because he has to carry things out to some other person it looks like looks like he's kinda in-between just carrying it for some other person.

I: And Picture No. 14 (Dock). Which boy or girl belongs in this picture?

S: The happy boy and girl.

I: Why?

S: Because they're happy to see their parents and things that they never saw before.

Part III

I: You've been such a wonderful helper, (Subject). I have some copies of these pictures and I'd like to give you some to keep for your very own. Which one would you like to have? This picture will help you to remember the ones that you have just seen. (Gives subject a composite picture of the Life-Situation Picture Series.)

S: They're all of them very nice.

I: UmHum. Which one would you like to have a copy of?

S: I think I'd like No. 6 (Church).

I: (Gives the subject a copy of the picture.) Why do you like No. 6?

S: Well you're always you're always kinda happy to go to church and seeing that I'm a Catholic I always ride to church with someone.

I: Which other one would you like to have?

S: I think I'd like this one No. 14 (Dock).

I: (Gives the subject a copy of the picture.) Why do you like this picture?

S: 'Cause everybody looks so happy and I like to have scenes that are happy like.

I: And you may have one more, (Subject). Which picture would you like now?

S: Let's see I think I like No. 1 (Bedroom).

I: (Gives the subject a copy of the picture.) Why do you like No. 1?

S: Well she's kinda peaceful too I don't know why I like it. I just like that one.

I: Tell me, (Subject), which picture wouldn't you like to keep?

S: Wouldn't.

I: UmHum. You just wouldn't like to have a copy of.

S: No. 8 (Swimming Hole). I don't think I like very much.

I: Can you tell me why you don't?

S: It looks some some of the kids are kinda mad there and I guess that's all I can think of.

I: Thank you very much for your help, (Subject). Perhaps you would like to go back to the other boys and girls now.

F. SUMMARY

This discussion of the methodology being employed to study the social perception of elementary-school children illustrates the close relationship

which must exist between the purposes of evaluation and the procedures used to obtain valid evidence about the behavior under observation. Because social perception involves selective awareness, idiosyncratic meaning, and feeling tone, a relatively unstructured approach must be used for the observation of these processes. To penetrate beneath the "surface-level" responses of very young children, however, measures must be taken to increase their involvement as they go through the data-gathering procedures. The nature of social perception also places a high premium on the meaningfulness to the subject of all the tasks he is asked to undertake. Motivation is correspondingly important, and must be continuously developed through a variety of direct and indirect methods. Lastly, great care must be taken to insure the validity of phenomenological data through the elimination of distortions caused by systematic factors or blockages in communication.

Stimuli used to evoke social perception must take into account the multi-dimensional structure of social situations. In the Life-Situation Picture Series, for example, social background factors and children's figures have been equated, and stimuli are presented to cover the range of categories in which social functions, spatial setting, and temporal setting have been classified. Data may, therefore, be analyzed for relative perceptiveness to different social backgrounds, and the propensity to identify with boy or girl figures. Groups may also be compared on each of the social function and perceptual field classifications, but no conclusions are warranted regarding their relative sensitivity to these categories because of the lack of balance among the stimuli presented for each. The possibility of equating *all* these dimensions in a series of social situations seems remote. A system of priorities must, therefore, be established by the investigator which will govern the development of his instrument and the analysis of data obtained through its use.

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EFFECT OF INJECTED ADRENALIN ON AN AVOIDANCE RESPONSE IN THE RAT*

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A. INTRODUCTION

Although there are indications that injected adrenalin may cause either "cold" or true emotional responses in man (1, 4), relatively few experiments have been done on the effects of adrenalin on emotional behavior in animals. Kosman and Gerard (3), using escape and avoidance learning in a Skinner box have shown that a subcutaneous injection of adrenalin in oil causes a decrease in the frequency of both a conditioned avoidance response, and an escape response. A study by Moyer (6) has shown that neither the learning nor extinction of an escape response is affected by a total bilateral adrenalectomy.

It was tentatively concluded in this latter paper that the secretion of adrenalin is not a necessary element to the development of the anxiety which Mowrer (7) indicates to be a factor in the learning of an escape response. This does not mean, however, that adrenalin plays no part in the generation of anxiety which may facilitate the learning of these types of responses. It may be that an excess of adrenalin will provide an autonomic disturbance sufficiently closely related to the autonomic responses of anxiety that the *S* will learn an avoidance response more quickly. It would seem reasonable to expect this since Mowrer (7) postulates that in avoidance and escape learning, the cues of the situation evoke not only the goal directed response which removes the *S* from the noxious stimulation, but also autonomic reactions which constitute the fear response, make the *S* uncomfortable, and motivate it to leave the situation in which those cues are found.

It is the purpose of this experiment to test the hypothesis that intraperitoneal injections of adrenalin will increase the rate of learning of an avoidance response in the rat.

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B. METHOD

1. *Subjects*

In this experiment, 50 naïve, male, hooded rats from the colony at the Carnegie Institute of Technology were used. All *Ss* were between 90 and 110 days of age at the time of testing.

2. *Apparatus*

The apparatus used has been described in detail elsewhere (5). Briefly, it consisted of an alley 10 inches wide, 35 inches long, with sides 16 inches high. There was a goal box in the front left-hand corner. The floor of the main alley was composed of two sections of brass rods, each section of which could be electrified separately, or both could be charged at the same time. The weight of the rat on each section of the grid activated a standard electric timer, thus indicating how much time the animal spent in each portion of the alley during any one trial. The goal box was provided with a guillotine door. Shock was provided by an electronic shocker with sufficient resistance built into the circuit to minimize individual resistance differences in the *Ss*. The intensity of shock used was one milliampere. This insured that all *Ss* would make highly active avoidance responses whenever the grid was charged.

3. *Procedure*

An avoidance procedure was used. The *S* was placed in the right-hand side of the box about three inches from the right and facing that end. The goal box door was open. After 10 seconds the door was closed for two seconds and shock was applied to the entire grid floor. Shock remained on until the *S* achieved the goal box and thus escaped shock. Approximately 10 seconds elapsed between trials. The *S* escaped shock any time it entered the goal box within 10 seconds of being placed in the main box. Each *S* was given 40 trials a day until it met the criterion of 30 consecutive successful avoidance trials. All groups were given the same training.

Five groups of 10 animals each were used. Group I received .09 mg. of adrenalin chloride per 100 gms. of body weight. Group II received .06 mg. Group III received .03 mg. Group IV received physiological salt solution, and Group V received no injection. Parke Davis adrenalin chloride 1:1000 preparation was used. It was diluted with physiological salt solution and a solution was made up for each group so that .1 cc of solution contained the appropriate amount of adrenalin for that group, i.e., .1 cc of solution for

Group I contained .09 mg. of adrenalin, Group II .06 mg., and Group III .03 mg. Group IV was given .1 cc of physiological salt solution per 100 gms. of body weight. Thus, each *S* was injected with the same amount of solution according to body weight. Each *S* was weighed daily and given an intraperitoneal injection of the appropriate solution immediately before the day's trials.

Fifteen *Ss* in Group I and one *S* in Group II died before reaching the learning criterion. Animals were substituted until the final *N* in each group equaled 10.

C. RESULTS

The means for trials to criterion and number of shocks received during training are presented in Table 1.

TABLE 1
MEANS FOR TRIALS TO CRITERION AND NUMBER OF SHOCKS DURING TRAINING

	Group I .09 mg.	Group II .06 mg.	Group III .03 mg.	Group IV Salt Sol.	Group V Control
Mean number of trials to criterion	129.6	108.7	115.9	90.2	101.8
Mean number of shocks during training	25.4	19.7	18.7	11.3	12.2

A Bartlett's test (2) for homogeneity of variance was applied to the number of trials to criterion. The Chi Square value was 7.67 and was not significant at the .05 level of confidence. An analysis of variance of the same data indicated that the differences between the means of the five groups were not greater than might be expected by chance. *F* equaled .67.

The Bartlett's test was also applied to the number of shocks received during training and was significant at the .01 level of confidence. Chi Square equaled 14.53. The heterogeneity of variances of the data indicated by the Chi Square value made questionable the results of an analysis of variance of the raw scores. A square root transformation was used whereby each individual *S*'s raw score total was treated as the score squared, the square root then being the transformed raw score. The Bartlett's test applied to the transformed data yielded a Chi Square value of 6.70 which is not significant at the .05 level of confidence. The transformation made possible an analysis of variance which indicated that the differences between the means of the five groups were not greater than might be expected by chance. *F* equaled .74.

D. DISCUSSION

The hypothesis that intraperitoneal injections of adrenalin will increase the rate of learning of an avoidance response in the rat is clearly not supported by these data. Neither the criterion of the number of trials to learn the problem, nor the number of shock trials during training are significantly different for the five groups. The only significant finding is that the variability within the groups tends to increase with the amount of adrenalin given. This is true when the number of shock trials received during training is used as the criterion. Although the results are not statistically significant, they are in the same direction as indicated in the Kosman and Gerard (3) study. In this avoidance situation there was a tendency for the adrenalin injected *Ss* to learn the problem more slowly than the controls. As was indicated by Kosman and Gerard, the heavy dose of adrenalin made the animals very ill. They had diarrhea and appeared to be weak and sluggish.

The lack of significant results could hardly have been due to the fact that an insufficient amount of the drug was used because 15 out of 25 of the *Ss* receiving the .09 mg. dosage did not survive long enough to reach the criterion. On the other hand, the *Ss* receiving the .03 mg. showed no signs of illness or disturbance.

It is possible that the shock was sufficiently strong that it activated the adrenal medulla of the *Ss* to an extent that the amount of adrenalin produced was maximally effective in the production of the autonomic reactions which are associated with the anxiety syndrome. If this were the case, any exogenous adrenalin by way of injection may have been superfluous and could not have served to increase the intensity of the anxiety syndrome.

These results may also mean that neither endogenous nor exogenous adrenalin is an essential feature of the anxiety syndrome. This view seems to be supported by previous results which showed that total bilateral adrenalectomy did not interfere with the acquisition or facilitate the extinction of an escape response (6).

E. SUMMARY

Fifty male hooded rats were used in this study. All *Ss* were taught to avoid shock by running to a small goal box off the corner of a shock alley 10 inches wide by 35 inches long. The *Ss* were given 40 trials a day until they met the criterion of successfully avoiding shock for 30 successive trials. The 50 animals were divided into five groups of 10 *Ss* each. Group I was given an intraperitoneal injection of .09 mg. of adrenalin chloride per 100 gms. of body weight. Group II was given .06 mg., Group III .03 mg.

Group IV was given a comparable quantity of physiological salt solution, and Group V was used as a control and given no injection. The number of trials to reach the criterion and the number of shocks received during training were recorded.

The results show that the group means do not differ significantly on either of these measures. When the number of shocks received during training is analyzed for homogeneity of variance, the Bartlett's test indicates that they are significantly heterogenous.

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BOOKS

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